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1986 Annual Report



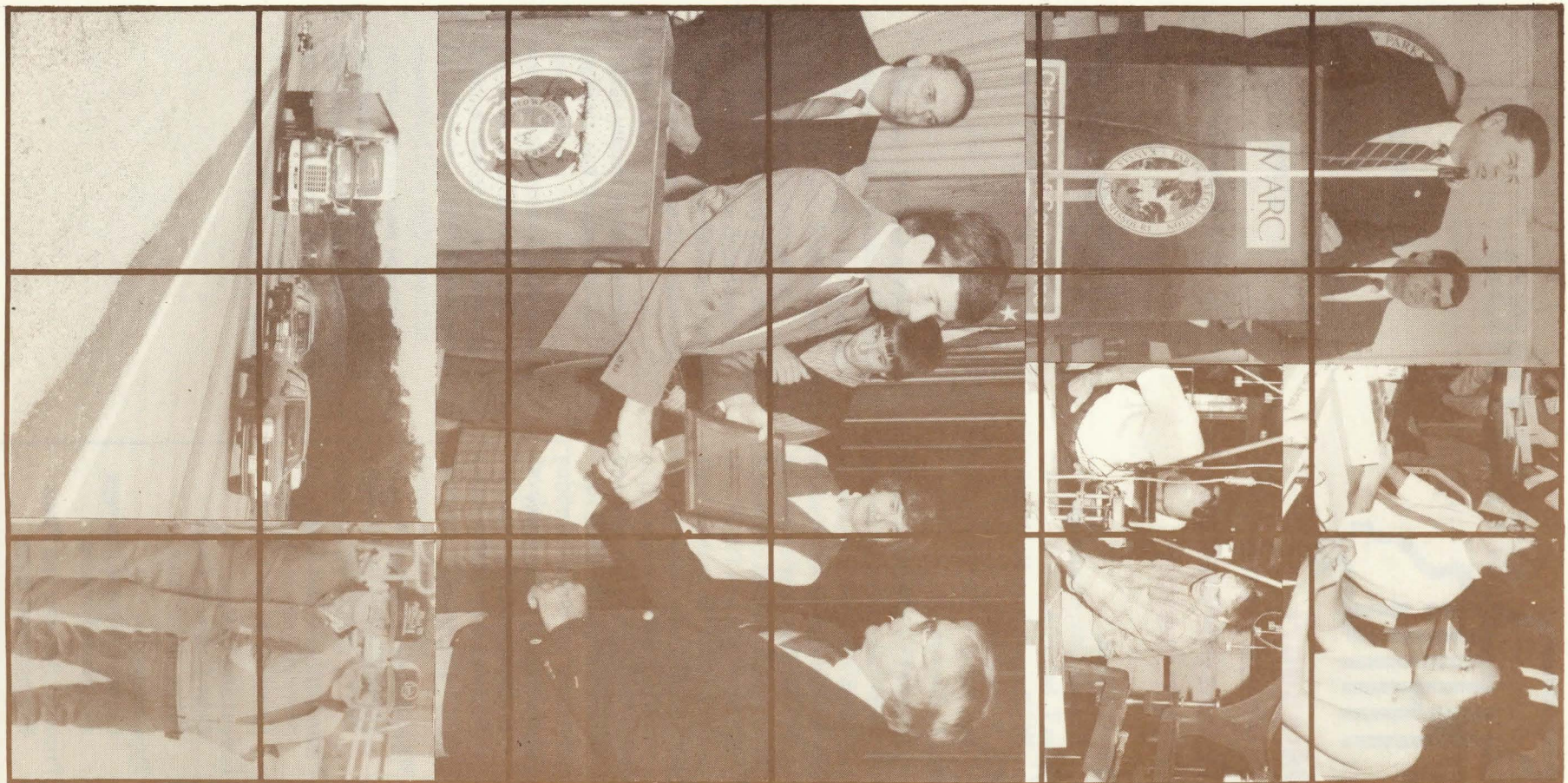
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Missouri Highway and Transportation Commission

1986 Annual Report





Missouri Highway and Transportation Commission

John C. Cozad,
Kansas City, Chairman
Helen T. Schnare,
St. Charles, Vice Chairman
Wm. F. Schierholz,
Des Peres
Paul L. Ebaugh,
Cape Girardeau
C.R. Johnston,
Springfield
Don Walsworth,
Marceline

Wayne Muri,
Chief Engineer
Rich Tiemeyer,
Chief Counsel
Mari Ann Winters,
Commission Secretary

Prepared and distributed by
the Public Affairs
Division, July 1987

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The year 1986 was a year of change for the Missouri Highway and Transportation Commission and Department. With a new leader, a new commission direction and new employee opportunities, the department ventured along a different path as it strived to serve the citizens of Missouri.

This annual report details the highway and transportation system status and the accomplishments and finances of the Missouri Highway and Transportation Commission for calendar year 1986. The report is assembled in a style meant to provide easy access to needed information. Brief descriptions of the functions of each unit within the Highway and Transportation Department are included.

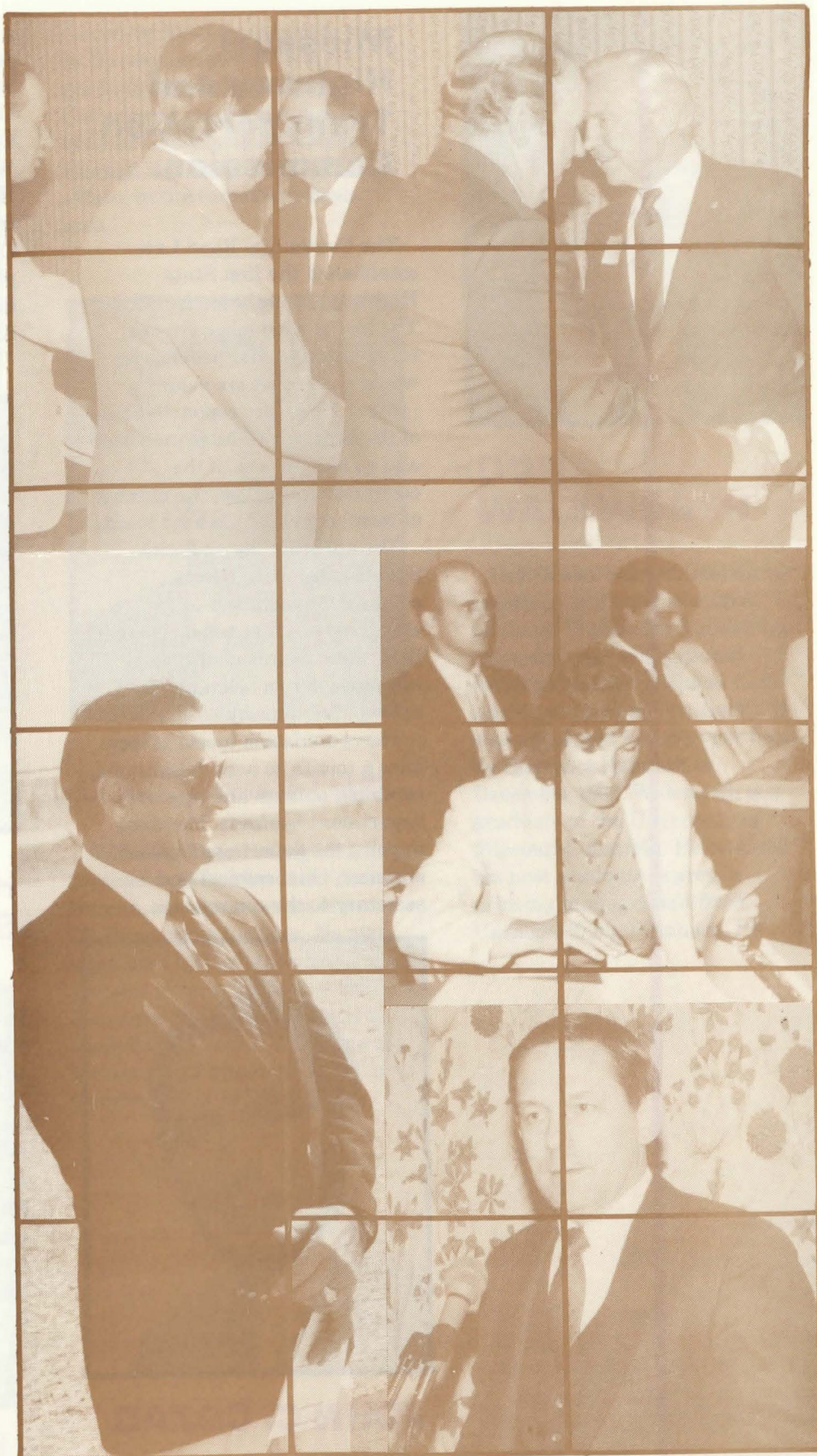
As required by law, the annual

report is distributed free to the governor, the supreme court, the secretary of state, the chief clerk of the House of Representatives, the state library and the legislative library. House Bills No. 96, 227 and 359, passed in 1983, require our department to charge others who request a copy of the report for the cost of printing and postage.

An informed and interested public is vital to the continuing development and operation of Missouri's highway and transportation programs. The department hopes this report increases taxpayers' understanding of the Missouri Highway and Transportation Department and its administration. Inquiries are welcome.

Missouri Highway and Transportation Commission

Organization



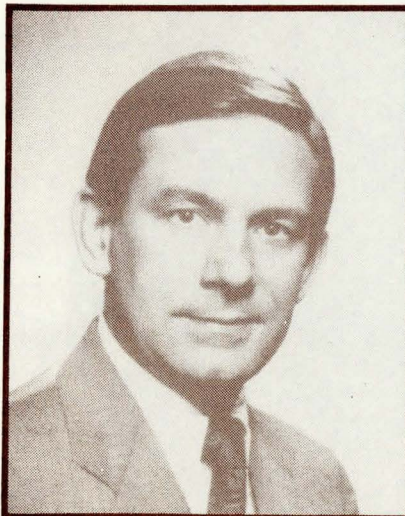
Missouri Highway and Transportation Commission

The Centennial Road Law established the first State Highway Commission in 1921. The law created a bi-partisan commission of four people who would each serve six years.

Since 1921, the responsibilities of the department have increased and so has the size of the commission. In 1956, the number of members was increased to six.

The governor, by and with Senate consent, appoints commission members to staggered six-year terms. No more than three members of the commission can belong to the same political party.

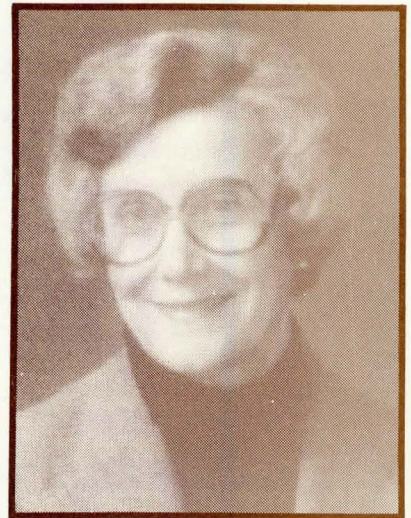
The commission meets at least once a month to hear delegations, establish policies and approve department business. Members appoint the department's chief engineer, chief counsel and secretary to the commission.



JOHN C. COZAD

John C. Cozad, Kansas City, is the current chairman of the commission. He was appointed to

a six-year term by Governor Ashcroft in December 1985 and was chosen chairman at the December commission meeting. Cozad is a graduate of Westminster College at Fulton. He received his juris doctor degree from the University of Missouri-Columbia, and is currently a partner in the Kansas City law firm of Morrison, Hecker, Curtis, Kuder and Parrish.



**HELEN T.
SCHNARE**

Helen T. Schnare, St. Charles, is the current vice chairman. She was appointed by Governor Bond to a six-year term in December 1983. She was chosen vice chairman in December 1985. Schnare received a bachelor of science degree from Southeast Missouri State University and a master's degree from the University of Wisconsin-Madison. She is a former teacher in the St. Charles School District.



WILLIAM F. SCHIERHOLZ

William F. Schierholz, Des Peres, is president of Chemtech Industries Inc. He was appointed to a six-year term by Governor Bond in December 1981. Schierholz received a bachelor of science degree from Washington University. He also served in the U.S. Army Air Force from 1942 to 1946. He is currently involved in many civic activities in the St. Louis area.



PAUL L. EBAUGH

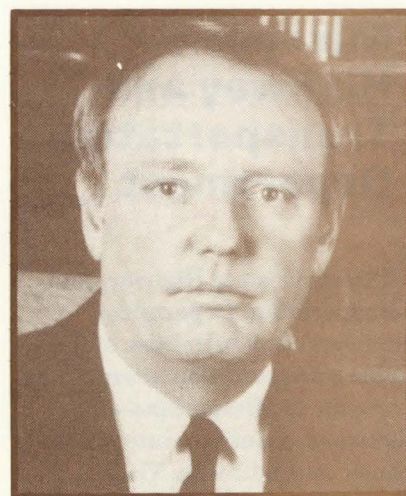
Paul L. Ebaugh, Cape Girardeau, was appointed by

Governor Bond to a six-year term in November 1983. He is a graduate of Baltimore City College and is a former president of Cape Construction Company. Ebaugh is a leader in community affairs in the Cape Girardeau area.



C.R. JOHNSTON

C.R. Johnston, Springfield, is president of the Missouri Farm Bureau, an organization of some 75,000 member families. He was appointed by Governor Bond to a six-year term in December 1983. Johnston has served on various councils and boards including the University of Missouri Board of Curators from 1975 to 1982.



DON WALSWORTH

Don Walsworth, Marceline, is president and chief executive officer of Walsworth Publishing Company, an international corporation that produces high school and college yearbooks. He was appointed to a six-year term by Governor Ashcroft in December 1985. Walsworth is a graduate of the University of Missouri-Columbia. He received his post graduate degree in printing management from Carnegie Tech, Pittsburg, PA.

Missouri Highway and Transportation Department

Missouri's state Highway and Transportation Department shoulders responsibilities of five viable transportation alternatives available to Missourians—highways, aviation, waterways, transit and railroads. Those responsibilities include the total operation of the 32,000-mile highway system, including highway location, design, construction and maintenance.

In addition, the department cooperates and coordinates with owners and operators of the other four modal systems in the development and improvement of airports, rail facilities, ports and the operational cost of transit

systems. Key here also is the administration of state/federal programs and funds available with these modes.

The Highway and Transportation Department became such as of January 1980 when voters decided to merge the previously separate Highway and Transportation Departments by passing Constitutional Amendment No. 2 in November 1979. The department operates under a decentralized organization with the Headquarters Office in Jefferson City. This office provides staff assistance and functional control for the various departmental tasks to the 10 geographic districts of the department.

The divisions within the headquarters office are responsible for bridge design and highway planning for the state. There are no counterparts for

these particular divisions in the districts. Decisions about highway construction, maintenance and operations are made at the district level.

Encompassing about 12 counties, each district contains about 10 percent of the total road mileage in the highway system. A district engineer is responsible for administering all activities in his district.

Transportation modes other than highways are established as units within the headquarters office and report to an Assistant Transportation Director. These units carry out the statewide planning for these modes—there are no counterparts in the districts.

District offices are located in St. Joseph, Macon, Hannibal, Kansas City, Jefferson City, Kirkwood, Joplin, Springfield, Willow Springs and Sikeston.

District 1

3602 N. Belt Highway
P.O. Box 287
St. Joseph, MO 64502

District 2

U.S. Route 63
P.O. Box 8
Macon, MO 63552

District 3

Highway 61 South
P.O. Box 1067
Hannibal, MO 63401

District 4

5117 E. 31st St.
Kansas City, MO 64128

District 5

1511 Missouri Boulevard
P.O. Box 718
Jefferson City, MO 65102

District 6

329 S. Kirkwood Road
Kirkwood, MO 63122

District 7

410 Range Line Road
P.O. Box 1445
Joplin, MO 64802

District 8

3025 E. Kearney
M.O. Box 868
Springfield, MO 65801

District 9

U.S. Business Rt. 63 North
P.O. Box 220
Willow Springs, MO 65793

District 10

U.S. Rt. 61 North of U.S. Rt. 60
P.O. Box 160
Sikeston, MO 63801

Headquarters

W. Capitol and Jefferson
P.O. Box 270
Jefferson City, MO 65102



Missouri Highway and Transportation Department

Missouri's Highway and Transportation Department is responsible for the state's transportation system. The department is divided into several divisions, including the Division of Highways, the Division of Transportation Planning, and the Division of Motor Vehicle Safety. The Department is also responsible for the state's public transportation system, including the Missouri State Transportation Authority and the Missouri State Transportation Board. The Department is committed to providing safe and efficient transportation for all Missourians.

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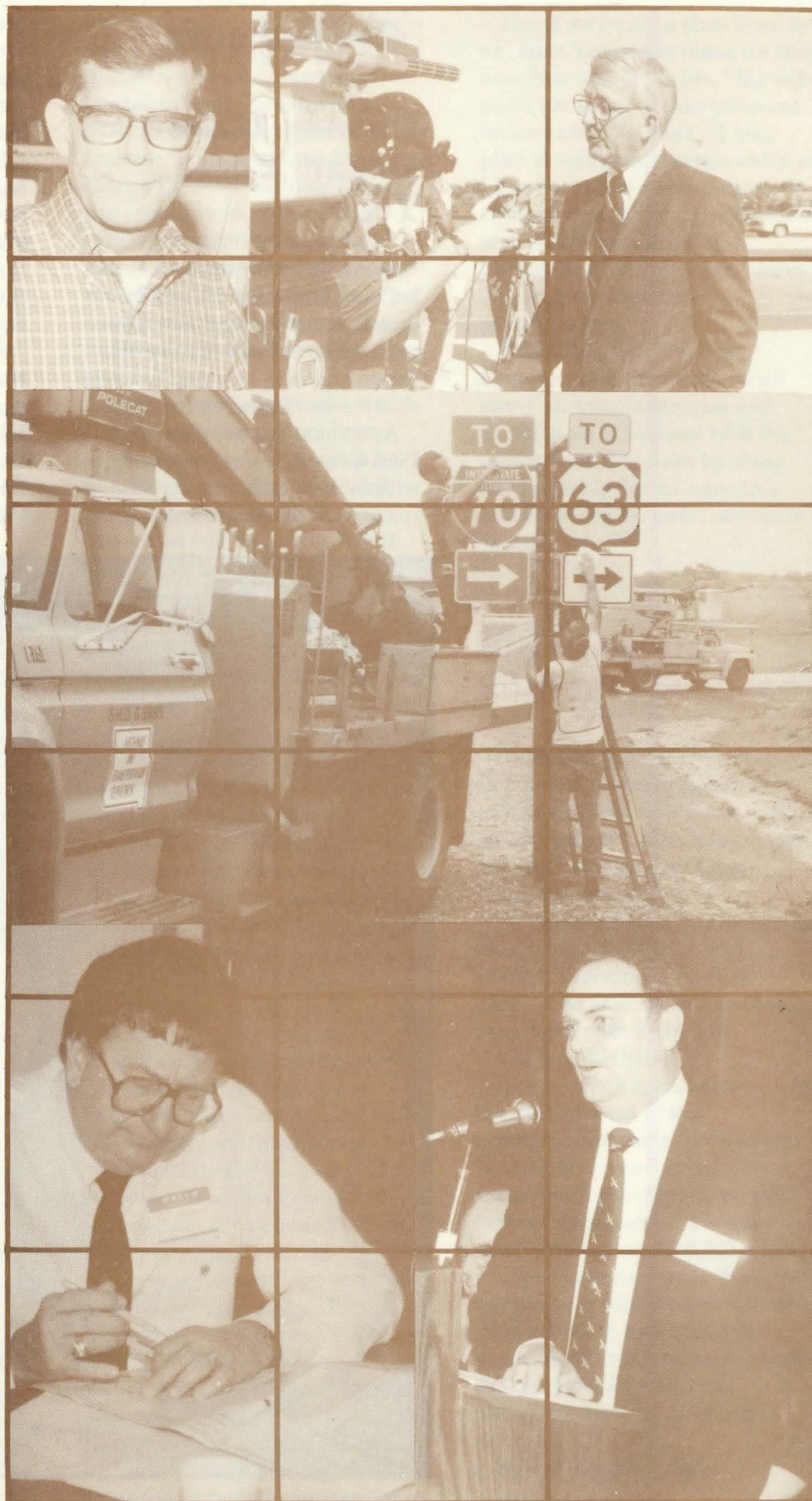
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Profiles



Retirements

Carney Makes Dream Come True

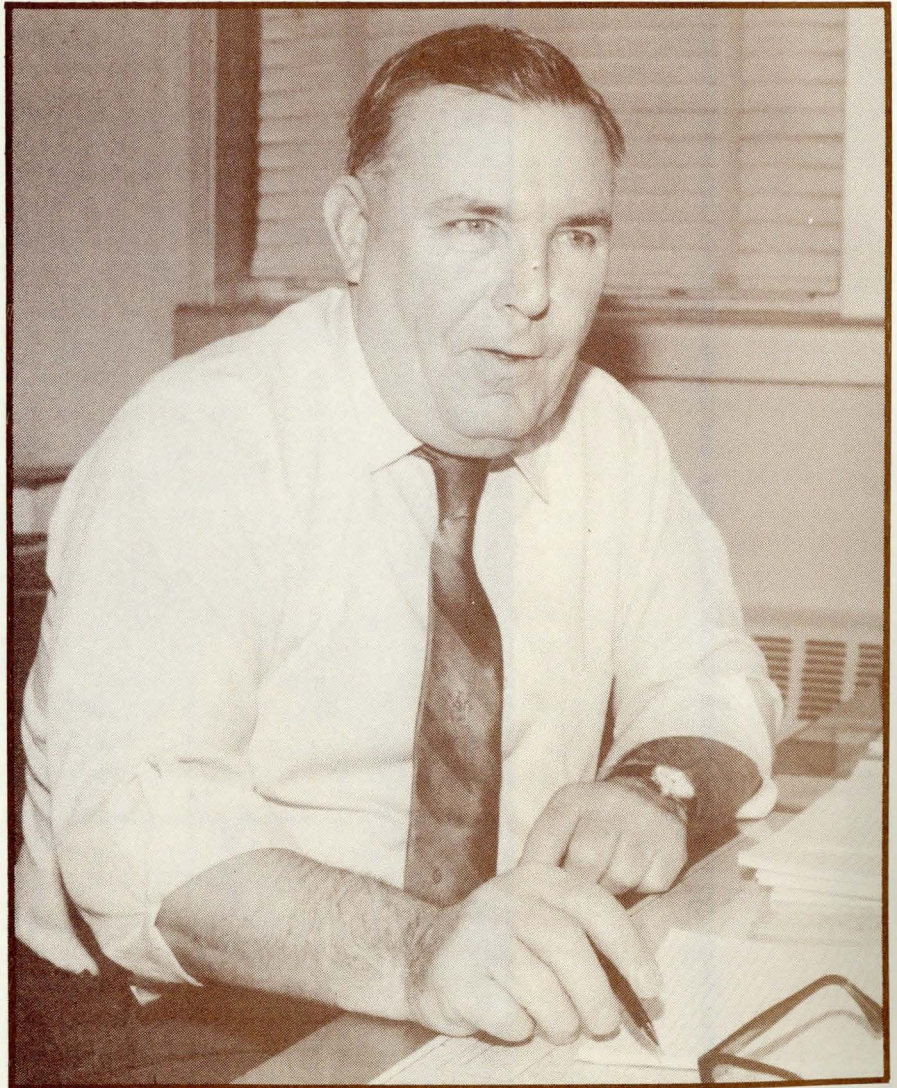
Dale Carney dreamed of building highways. He saw his dream come true. And now upon retirement, he looks back on this dream and says he's glad he chose to travel the road he did.

As a youngster growing up in Dent County, Carney watched with interest and curiosity as roads were constructed near his

home. His father was a member of the county highway commission, and roads were often a topic of conversation around the Carney home.

But his dream had a special hope tucked inside of it—Carney not only wanted to build highways, he wanted to build them as part of the work force of the Missouri State Highway Department.

So along the road to fulfilling his dream, Carney pursued a civil engineering degree from the Missouri School of Mines at Rolla. During the last semester of school, he worked part time for the department assigned to the



Dale Carney

maintenance building at Rolla.

After graduation in 1949, Carney joined the department full time as an engineer inspector II at Lebanon in District 8. He also served as an engineer inspector III, project engineer, resident engineer and resident engineer I in the district.

In 1957, Carney transferred to District 9 as the district engineer assistant. He returned to District 8 in 1959 in that same position. In 1960, he came to the Main Office in Jefferson City as a senior engineer III in the Surveys and Plans Division.

Carney was promoted to District 10 engineer in 1963, and then in 1968, he received his promotion to Bridge Division engineer, the position he held at the time of his retirement.

"I was probably the most surprised person in the state when Mr. Snider called me and asked me to be bridge engineer,"

"It's great to be involved in providing a service that people rely on."

—Dale Carney

Carney recalls with a laugh and a look in his eye that says the memory seems like only yesterday.

In his position as head of the Bridge Division for the past 18 years, Carney has had the responsibility of overseeing the design and development of plans for new structures and the rehabilitation of old structures. This division keeps track of all bridges in the state—about 24,000 all together. Some 14,500 are city and county bridges, while the state bridge total is about 9,200.

But there's one particular bridge, Carney says, that was a career highlight—its picture had

a special place in his office. "I was a district engineer at Sikeston when the states first started talking about a bridge over the Mississippi River at Caruthersville, and then I was Bridge Division engineer during the actual construction of the present structure on Interstate 155. It was quite rewarding to see something like that start, be involved in the building process, and then watch it serve the people."

It's this service to people that Carney says has always been exciting to him. "It's great to be involved in providing a service that people rely on; it's great to know that you helped meet that need. I can remember when our roads were gravel strips and tracks of mud, and I appreciate the strides we have made in the transportation system."

Not only has Carney served the department, he has also been involved in transportation and engineering activities on the national level. He is a member of the National Society of Professional Engineers and Missouri Society of Professional Engineers. He also belongs to the Jefferson City Engineers Club and the American Society of Civil Engineers.

Carney has served on the American Association of State Highway and Transportation Officials Bridge and Structures Committee and the Advisory Panel of National Cooperative Highway Research Program. He is a member of Tau Beta Pi and Phi Kappa Phi, honorary engineering fraternities, and Chi Epsilon, an honorary civil engineering fraternity.

In 1973, Carney was selected to the Academy of Civil Engineers at the University of Missouri-Rolla. He was also presented with an honorary degree in civil engineering from the university in 1978.

But there comes a time to move on, and Carney has plans for this new direction of his life. "My wife and I are going to take off in our motor home," he says. "I also plan to enjoy my summer cabin at Forsyth, and of course, we want to keep track of our grandchildren and watch them grow up." Carney and his wife, Mary, have two children and three grandchildren.

And though he'll be busy, Carney will undoubtedly recall many pleasant memories and experiences of his time with the department. The path he chose has made his dream come true and benefited Missouri motorists as well.

M&T Division Engineer Retires

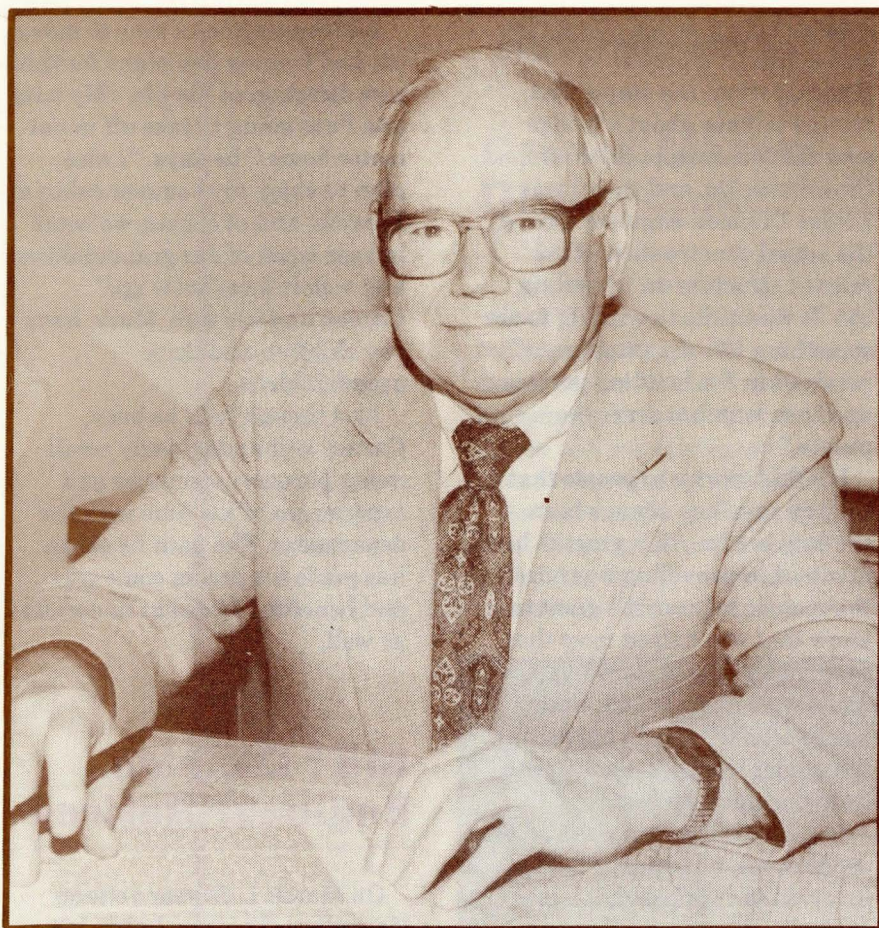
On March 1, 38-year veteran Kenneth C. Townley began his retirement. And in looking back on these many years, he says he's enjoyed being a part of the "highway team."

"I've always been impressed the most by the dedication and unselfish service of the field people," he says. "I've liked being associated with them and working with them."

Another highlight, he says, was the development of the supplementary highway system. "I remember when every winter these roads would break up and become impassable," Townley adds. "We had about 8,000 miles of supplementary roads then. We added about 10,000 miles between 1952 and 1962, and it was the department's maintenance people that stabilized these roads. Today, we have an all-weather system."

Still another highlight,

(Please continue.)



Ken Townley

Townley adds, has been the development of the freeway-type highway, which includes the Interstate system. "Missouri has done a good job," he says. "Our system is the best there is!"

And he speaks from experience. During the 38 years since Townley joined forces with the department, the state road mileage has doubled. He has watched the system grow and improve. In his position as Maintenance and Traffic Division engineer, he has been responsible for the general maintenance and operation of the entire 32,000-mile state highway system.

"Ken Townley has served during a period of time when our finances were stretched to the breaking point," says Joseph A. Mickes, Townley's replacement. "Maintenance is the single largest user of our highway

money, and because of Ken Townley's vast knowledge and skill, he has helped pull us through these lean times."

Townley first began his contributions to the department in 1948 as a gang foreman in District 5. During his career he also held the positions of acting foreman, engineer inspector II, district foreman, district maintenance and traffic engineer, senior engineer III, assistant traffic division chief and district engineer at St. Joseph. He was promoted to his position as Maintenance and Traffic Division engineer in 1971. He also worked in District 8.

A Professional Engineer, Townley was born Feb. 9, 1921, at Chamois. He graduated from Chamois High School in 1938. Townley served in the U.S. Army during World War II, serving in New Guinea and the Philippines.

In 1948, he graduated from the University of Missouri-Columbia with a bachelor of science degree in mechanical engineering. In 1949, Townley married the former Esther Johns of Mint Hill. The Townleys have three children: Michael, Gail and Dan.

Townley is a member of the National Society of Professional

"Missouri has done a good job. Our system is the best there is."

-Ken Townley

Engineers, the Missouri Society of Professional Engineers and the Highway Engineers' Association of Missouri. He is a Mason and a Shriner and enjoys auctions, mechanical work and woodworking.

Part of Townley's retirement plans include visiting his children, but other than that he says, "I'm going to take it one day at a time!"

Klamm Closes Out Career

"If I had it to do over," says Carl Klamm, "I'd still want to be an engineer." After 39 years in this line of work, he's quick to say it's always been more than just a job to him. He credits the opportunities his profession offers for many of his successes and accomplishments, along with, he says chuckling quietly, "a little luck!"

As a young teenager in high school enjoying his mechanical drawing classes and his physics assignments, Klamm was attracted to the field of engineering. After graduating from North Kansas City High School in 1940, he attended school for three years at the University of Missouri-Columbia (UMC). In 1943, he left school to serve in the armed forces with assignment in the Philippines. When he was discharged in 1946 as a first lieutenant in field artillery, he returned to UMC to complete his education. In 1947, he graduated with a civil engineering degree.

On June 16, 1947, Klamm reported to work for the Missouri Highway Department as an engineer inspector II at the Materials Laboratory in Jefferson City. Later that year he was transferred to District 8 at Springfield where he served as an engineer inspector III, a project engineer and a resident engineer.

While in Springfield, Klamm says, he worked on a project he calls one of his career highlights. "I was just getting started," he says, "when the department was building Glenstone Avenue. I worked on the north end of the project as an instrumentman, and then as a resident engineer on the south end. It was my first big job—it was make it or break it," he adds laughing, "and I've

always remembered that experience."

In 1955, Klamm moved back to Jefferson City as district engineer assistant in District 5. He was promoted to senior engineer III in 1959 and transferred to the Main Office Planning Division. In 1961, he moved to Willow Springs as District 9 engineer. After just a few short months there, he moved to District 4 engineer in Kansas City.

"Though all of my positions with the department have been challenging to me," Klamm says, "none were quite like that job in Kansas City! There was a tremendous work load, and the job was quite demanding."

Klamm returned to Jefferson City in 1964 as division engineer in Construction. He became division engineer in Planning in

(Please continue.)



Carl Klamm

1972. On Nov. 15, 1984, following the death of Wilben H. Dill, he was named the department's assistant to the chief engineer-operations, the position he held at the time of his retirement. In this job, Klamm was in charge of work activities concerning construction, materials and research, maintenance and traffic and equipment and procurement.

Klamm, 64, was born June 15, 1922, in Parkville. He married his wife, the former Billie Kile of Tulsa, OK, on Dec. 13, 1944, while he was in the service. The Klamms have three sons: Tom, Richard and Kenneth.

A Professional Engineer, Klamm is a Fellow in the American Society of Civil Engineers and a member of the

**"If I had it to do over,
I'd still want to be an engineer."**

—Carl Klamm

Jefferson City Chapter of the Missouri Society of Professional Engineers. He is also a member of Chi Epsilon, an honorary civil engineering fraternity. Klamm is serving as an elder in the Jefferson City First Presbyterian Church.

When retirement officially began July 1 for the long-time service veteran, it ended a career of dedicated service. But to Carl Klamm, the road doesn't actually end there, it just takes a turn and moves on around the bend. He says he and his wife will continue to live in Jefferson City and are looking forward to traveling.

"When something comes along, I always look for what I'll enjoy about it," he explains, "not for what I won't enjoy. I enjoyed school and college and those early years in the department when I was struggling to get started. I even enjoyed the Army! And now I'm going to enjoy retirement!"

Chief Counsel Ring Retires

When Chief Counsel Bruce Ring joined the Missouri Highway and Transportation Commission as an assistant attorney, he thought he'd only work here three years.

That was thirty-five years ago!

"I guess I just got too busy to go look for something else," Ring says with a chuckle.

But now after 12 years as chief counsel for the commission, Ring has filed his retirement brief. Whether it's a legal question of right-of-way acquisition, equal employment opportunity or contractor claims, Ring's career of hard work and dedication has given him the answers.

Ring, 64, says it was in high school at Jerico Springs where he developed his interest in becoming a lawyer. After graduation in 1941, he served in the Army Air Corps in the South Pacific during WWII.

After the service, Ring attended the University of Missouri-Columbia, where he received a bachelor of arts degree in 1949 and his law degree in 1951. "I thought law school was easier than my undergraduate work," Ring says, making one think he'd made the right choice in becoming a lawyer.

He joined the department in 1951 as an assistant attorney and was promoted to assistant counsel in 1955. These positions involved drafting contracts, rendering opinions and trying numerous construction contract and condemnation cases.

At that time, there were only four lawyers for the department, all based at the Main Office. Ring spent long hours working and traveling around the state. "I remember one year, I put in excess of 50,000 miles on the state car—most of it at night!" Ring says with a shake of his head.

And with these long hours and this dedication came more promotions. In 1963, he was promoted to assistant to the chief counsel. In this position, Ring continued to render legal opinions, try eminent domain and construction contract cases, as well as perform supervisory and administrative functions of the legal office.

Then in 1974, he was appointed

chief counsel, serving as advisor to the commission and the chief engineer in all legal matters. The chief counsel is also responsible for drafting legislation and supervising the legal office.

But it's been the trial work that Ring has enjoyed the most during his career. One of his most memorable cases is a condemnation suit involving the effect of building an outer

roadway between property and the throughway of a highway. It was during this case in 1965 that Ring was admitted to practice in the U.S. Supreme Court.

As Ring has progressed with the department, he's seen the commission's legal office do the same. From the four lawyers when he began, the staff has expanded to the 20 lawyers who Ring currently supervises, with eight in the Main Office and 12 in the districts. The department has employed 24 lawyers at one time.

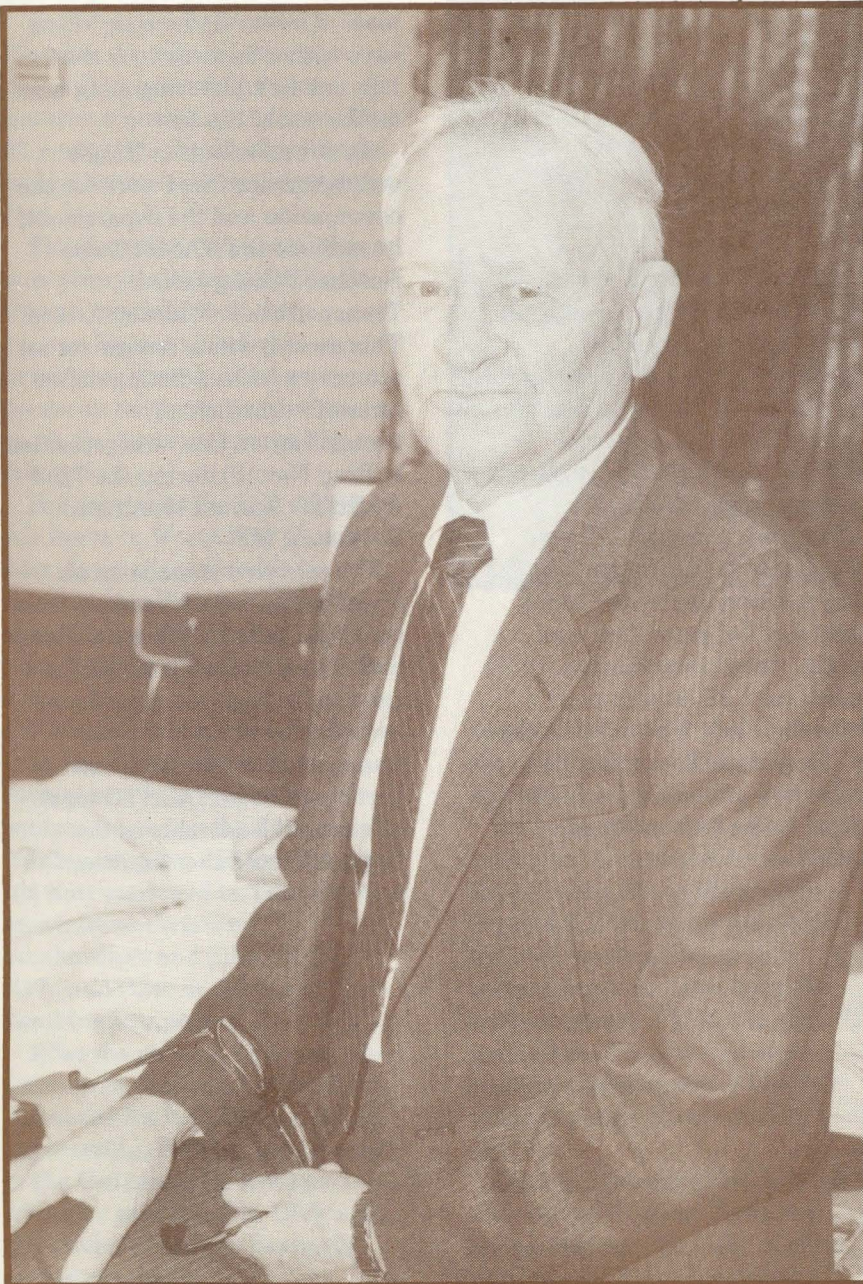
Ring's office itself has been a source of kidding through the years. His desk and tables have always been stacked high with manilla folders and papers, but rumor has it that Ring knows exactly where everything is.

One time, then Commission Chairman Jay Dillingham came to Ring's office, noticed a clear spot on his desk and commented on it. Ring jokingly replied, "That's where I put the work I'm done with!"

Ring's years have been busy ones, and he says he's enjoyed working for the commission and the department. "There have been a few times when I got a little discouraged about things, but usually, you didn't have time to get discouraged."

In the commission and the department's future, Ring sees a continuing increase in tort litigation with suits alleging negligence. For the department in general, Ring sees a need for more money. "I'd like to see the department be able to get some additional funding," he says. "Then we could get a good program developed to keep our system up where it should be."

During his career with the department, Ring has made time to participate in professional organizations on the national and local level. He has been a member



Bruce Ring

(Please continue.)

of the American Association of State Highway and Transportation Officials (AASHTO) Legal Affairs Subcommittee, having served on several task forces within this group.

On the local level, Ring is a member of the Cole County Bar Association, having served as president of the group, and the Missouri Bar Association (MBA). He wrote the chapter on Moving

Ring's years have been busy ones, and he says he's enjoyed working for the commission and the department.

Expense and Relocation Costs for the Eminent Domain Handbook of the MBA (1973) and its supplement (1985). He also wrote the chapter on Eminent Domain for the Real Estate Practice Handbook of the MBA (1972) and its supplement (1982).

And there's been time for a special side to Ring's life. In 1959, Ring married the former Irene Fechtel of Jefferson City, and they've raised two children. Judith Ann, 26, now lives in Overland Park, KS, and B. Alden Jr., 25, lives in Rochester, NY, where he's attending graduate school at the University of Rochester.

As for his retirement, Ring doesn't think he'll have any trouble keeping busy. "I figure I can make it a year. After that, I might have to look around for something to do."

First on his list is to catch up on the hunting and fishing he's missed out on through the years. Ring's hunting favorites are dove, quail, deer and pheasant. He also likes to float fish on the Norfolk and Eleven Point rivers. "I'm more of a lazy fisherman," Ring says with a faraway look that tells one he's picturing a big bass on the end of his line.

As a final tribute to Ring's dedication and hard work for the commission and the department, he received the AASHTO Joe Buscher Distinguished Transportation Attorney Award. This award, which recognizes an attorney who has distinguished himself in the field of transportation law, was presented to Ring Nov. 10 during the 72nd AASHTO Annual Meeting in Baltimore, MD.

The selection is made by an appointed group of members from the Legal Affairs Subcommittee and is based on such criteria as outstanding service, significant contributions to the transportation law field, active participation in AASHTO legal affairs and leadership in the Legal Affairs Subcommittee.

Farewell to Fletcher

For Leland D. Fletcher, it was training in the service and a love of math that picqued his interest in engineering. And from engineering school, it was the reputation of the Missouri State Highway Department that led him to work here.

But now, the 65-year-old Fletcher is ready to leave the designing, supervising and number crunching to others. After 36 years with the department, he retired as assistant chief engineer Dec. 31.

Fletcher says, "Mathematics was always a natural for me. It was so logical! I took extra courses in math, and my experience was that the next course in mathematics always made the previous course like ABCs."

His service in the U.S. Army Air Force in World War II also stimulated his interest in engineering, Fletcher says. He spent 38 months serving Uncle Sam stateside. "I was lucky," he adds.

Fletcher had highly technical training in automatic flight control and bomb sighting equipment, using the Sperry and Norden systems. He spent most of his time stationed in Tennessee as an instructor training bombardiers and pilots of the B17s and B24s in the use of the bombing equipment.

After the service, Fletcher, who grew up in Arkansas, entered Arkansas State College to study engineering. He then transferred to the University of Arkansas where he graduated in 1949 with a bachelor of science degree in civil engineering.

The department had a good reputation at the university, and there were several successful



Leland Fletcher

people from college who worked at the department, so Fletcher signed on.

He began his career as an assistant plans designer in the Surveys and Plans Division in District 8. From there his career took off, leading him to his current position. "I've been the luckiest person," Fletcher says. "I would have been well pleased with this department if I hadn't reached nearly this level that I did."

During his career, Fletcher has also served as plans designer, plans designer III, chief of party, designer II, district engineer's assistant, senior engineer III, District 1 engineer, District 4 engineer, division engineer-

Maintenance and Traffic, division engineer-Surveys and Plans and assistant to the chief engineer-planning and design. He also worked in District 3 for a short time.

Changing jobs and changing locations over the years also involved some changes in Fletcher's personal life. He and his wife, the former Jane Carpenter of Piggot, AR, have enjoyed 45 years of marriage. During his department years, they raised two children, Jill and Leland Jr., as they moved around the state.

"You always wondered when you moved, but we never had any

(Please continue.)

problem," Fletcher says. "Jane was always willing. She never raised a question."

Saying he's liked all the different jobs he's had with the department, Fletcher still holds one especially close to his heart—district engineer. "The DE's job was the most satisfying work," he explains. "You're involved in all phases of department operations. You see something from beginning to end, whatever it may be."

Fletcher credits his success with the department to the many people who helped him along the

"The DE's job was the most satisfying work. You see something from beginning to end, whatever it may be."

—Leland Fletcher

way, one of whom was R.W. "Pat" Patton, former District 1 and District 3 engineer, and Marvin Snider, former chief engineer. "They gave me a lot of guidance and some good basic training for the department during my early years."

Throughout the years, Fletcher has seen the department grow and change. The development of the Interstate system, seeing it from its beginning to its end, has been a continuing highlight for him. "I'm not alone there," he says. "There are a number of department people who have that experience."

Another development Fletcher was involved with was the takeover program between 1952 and 1962. This program brought more than 12,000 miles of county

roads up to state standards and put them under state jurisdiction.

Fletcher will also remember the past several years with the department. He says, "The last era of getting by with very little has been an experience in itself."

But Fletcher looks for this era to come to a close. "I don't bet on anything but sure things, and I'm confident that we'll have additional funds by this time next year," he says. "I think the people are beginning to recognize that they want the highway system kept up with the needs of the state."

And as he looks down the retirement road, Fletcher is ready for a more relaxed lifestyle.

"When you're not working a 40-hour week, you can go when you want—you have more freedom. That will be nice."

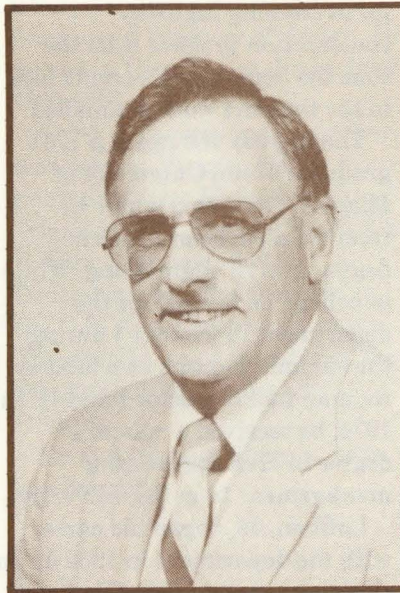
Fletcher and his wife plan to continue living in Jefferson City. "I want to suffer through winter, so I can enjoy spring and summer," he says jokingly. They have a bit of traveling on their schedule and will probably spend more time with their family.

Jill, now 34, lives in Springfield, IL, where she and her husband have two daughters. Leland Jr., 30, lives in Jefferson City and has one son. The grandchildren will be glad to take up any of "Grandpa's" spare time.

Fletcher also plans to do some woodworking. He says, "I like to tinker and work with my hands."

He won't be doing highway work any longer, but you can be sure Fletcher's interest in engineering, begun those many years ago, will continue. And so will his appreciation of the department. "We have a good department, and we have every right to be proud of it."

Promotions



Roy I. Coplen

District 10 Engineer

Roy I. Coplen, former assistant division engineer-maintenance, was promoted to District 10 engineer at Sikeston Jan. 1. He replaced Allen F. Laffoon who was appointed Construction Division engineer.

As District 10 engineer, Coplen oversees the highway and transportation work in the counties of Bollinger, Butler, Cape Girardeau, Dunklin, Madison, Mississippi, New Madrid, Pemiscot, Ripley, Scott, Stoddard and Wayne.

Coplen, 60, began his career with the department in 1949 after graduating from the Missouri School of Mines, Rolla, with a bachelor of science degree in civil engineering.

He has held a variety of positions including engineer inspector II and III, project engineer, resident engineer,

maintenance superintendent, district engineer's assistant and field liaison engineer-maintenance.

Coplen, a Professional Engineer, was born in Clinton, the son of the late Roy and Mary Coplen. He was educated in the Higginsville school system and served in the U.S. Army from 1944-46.

He and his wife, Margaret, have two children.

—On Nov. 7, Chief Engineer Wayne Muri announced that Coplen would be promoted Jan. 1, 1987, to Maintenance and Traffic Division engineer.



Allen F. Laffoon

Construction Division Engineer

Allen F. Laffoon, formerly District 10 engineer, was named Construction Division engineer, a position he assumed Jan. 1. He replaced William H. Shaw who was promoted to assistant chief

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engineer-planning and design in December 1985.

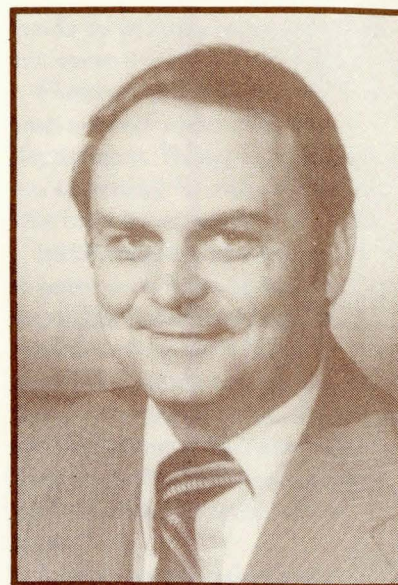
As Construction Division engineer, Laffoon is responsible for overseeing highway construction projects from the time the department accepts bids to the time the work is finished.

The 25-year veteran is a 1961 graduate of the University of Missouri-Columbia where he received a bachelor of science degree in civil engineering. While in college he worked for the department in District 4 during the summer months as a laborer, rodman and inspector I and II. In 1974, he received a master's degree in civil engineering management from the university.

Laffoon, 49, began his career with the department in 1962 as an engineer inspector I in District 4. During his years of service he has also held the positions of engineer inspector II and III, senior construction inspector, resident engineer, assistant to the district construction engineer, district construction engineer, planning traffic engineer and field liaison engineer-maintenance. He was promoted to District 10 engineer in April 1982. In addition to his Main Office and District 4 and 10 assignments, he has served in District 1.

A Professional Engineer and Land Surveyor, Laffoon was born in Kansas City and educated in the school system there. He served in the U.S. Army for a six-month period during 1961.

He and his wife, Sue, have two children.



Wayne Muri

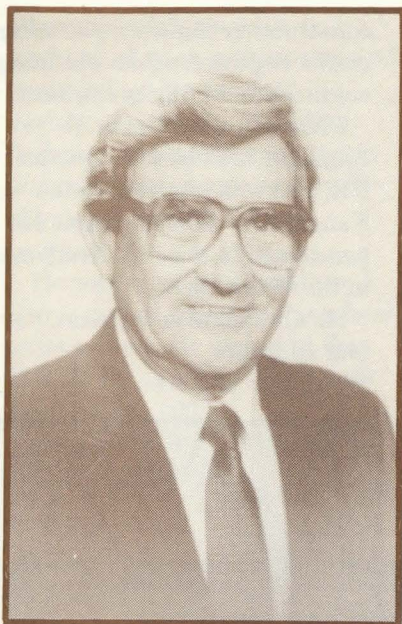
Chief Engineer

Wayne Muri, former District 5 engineer, became chief engineer Jan. 1. Chosen by the Highway and Transportation Commission in September 1985, Muri replaced Robert N. Hunter who retired. As chief engineer, Muri directs highway and transportation operations throughout the state.

Muri, a Professional Engineer, is a 1960 graduate of the University of Missouri-Columbia where he received a bachelor of science degree in civil engineering. He worked for the department in a variety of summer positions during college.

During his 26 years with the department, Muri has served as a designer, senior engineer, signal and lighting engineer, sign and marking engineer, traffic studies and corrections engineer, district maintenance and traffic engineer, field liaison engineer and utilities engineer.

Muri, 48, is a Jamestown native. He and his wife, Bonnie, have one son.



P. Owen Redel

District 5 Engineer

P. Owen Redel, former assistant division engineer in the Surveys and Plans Division, was promoted to District 5 engineer at Jefferson City Jan. 1. He replaces Wayne Muri who was appointed chief engineer.

As District 5 engineer, Redel, 61, oversees highway and transportation work in the mid-Missouri counties of Boone, Callaway, Camden, Cole, Cooper, Howard, Maries, Miller, Morgan, Moniteau, Montgomery and Osage.

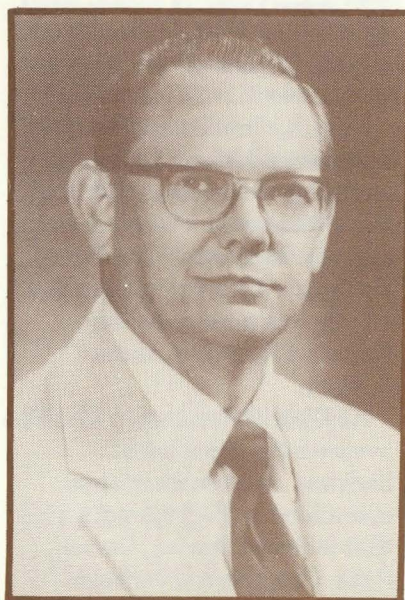
Redel is a 1955 graduate of the Missouri School of Mines at Rolla where he received a bachelor of science degree in civil engineering. He began work with the department in 1952 as a rodman in the Construction Division at District 5 while attending college. He joined the department full time in 1955 as an engineer inspector in District 5.

During his career, Redel has also held the positions of engineer

inspector I and II, designer II, III and IV, chief designer, district engineer assistant, district surveys and plans engineer, field liaison engineer-location and design and engineer of design. He served in District 7 at Joplin from 1960-1967.

Redel, a Professional Engineer, was born in Vienna. He graduated from Vienna High School in 1943. During World War II from February 1944 to December 1946, Redel served in the U.S. Army in the European Theater. He was a member of the 9th Army, 102nd Infantry Division.

He and his wife, Bonnie, have one daughter.



Frank L. Carroll

Bridge Division Engineer

Frank L. Carroll, former District 9 engineer, was promoted to Bridge Division engineer Feb. 1. He replaces W. Dale Carney who retired.

In this position, Carroll oversees the division responsible

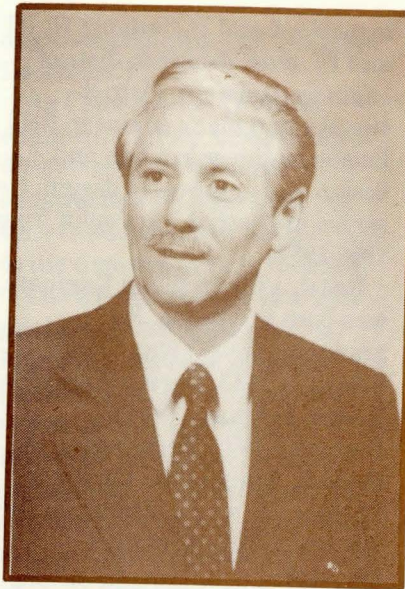
for designing bridges on the state's highway system.

Carroll, 54, began his career with the department in 1955 after graduating from the Missouri School of Mines, Rolla, with a bachelor of science degree in civil engineering. He received a master of science degree in engineering from the University of Missouri-Rolla in 1975.

He has held a variety of positions within the department including designer, engineer inspector, district chief designer, district surveys and plans engineer, field liaison engineer-location and design and urban planning engineer.

Carroll was born in Poplar Bluff and educated in the school system there. He served in the U.S. Army's 23rd Armored Engineer Battalion from 1955 to 1957.

He and his wife, Jane, have two children.



Gary B. Chullino

District 4 Engineer

Gary B. Chullino, former assistant division engineer-planning, research and traffic, was promoted to District 4 engineer in Kansas City Feb. 1. He replaced George L. Satterlee Jr. who resigned to become Kansas City public works director.

As District 4 engineer, Chullino oversees the department's highway and transportation operations in the 12-county area that includes Benton, Carroll, Cass, Clay, Henry, Jackson, Johnson, Lafayette, Pettis, Platte, Ray and Saline counties.

Chullino, 49, began his career with the department in 1960 following his 1959 graduation from the Missouri School of Mines, Rolla, with a bachelor of science degree in civil engineering.

He has held a variety of positions including engineer inspector I, II and III; senior construction inspector; resident engineer; assistant to district construction engineer; district

construction engineer; planning traffic engineer; urban planning engineer and utilities engineer.

Chullino, a Professional Engineer, was born in Omaha, NE, and was educated in the Kansas City school system. He has served in the U.S. Army and in the Reserves.

He and his wife, Patricia, have four children.



Willis L. Graven

District 9 Engineer

Willis L. Graven, former contract controls engineer in the Construction Division, was promoted to District 9 engineer at Willow Springs Feb. 1. He replaced Frank L. Carroll who was promoted to Bridge Division engineer.

As District 9 engineer, Graven oversees the 10-county area that includes Carter, Dent, Douglas, Howell, Oregon, Ozark, Reynolds, Shannon, Texas and Wright counties.

Graven, 51, began his career with the department in 1958 after graduation from the University of

Missouri-Columbia with a bachelor of science degree in civil engineering. He has held a variety of positions including designer, engineering inspector, district maintenance and traffic engineer and field liaison engineer.

He was raised in Mountain Grove and educated in the school system there. He served in the U.S. Army as a first lieutenant from 1958 to 1962.

He and his wife, Mary, have two children.



Joseph A. Mickes

Maintenance and Traffic Division Engineer

Joseph A. Mickes, former District 7 engineer, was promoted to Maintenance and Traffic Division engineer March 1. He replaced Kenneth C. Townley who retired.

As Maintenance and Traffic Division engineer, Mickes oversees statewide maintenance activities such as snow removal, sign and signal installation,

right-of-way mowing and traffic accident data collection.

Mickes, 51, graduated in 1958 from the Missouri School of Mines, Rolla, with a bachelor of science degree in civil engineering. He joined the department that same year as an engineer trainee in District 6. He had worked for the department as an engineer inspector I in District 6 during the summer months while attending college.

During his career he has also held the positions of engineer inspector II and III, senior engineer I and II, field liaison engineer-electrical and assistant division engineer-traffic.

Mickes, a Professional Engineer, was born in University City. He graduated from Mercy High School and served for eight years in the U.S. Army Reserve, reaching the rank of captain.

He and his wife, Darlene, have three children.

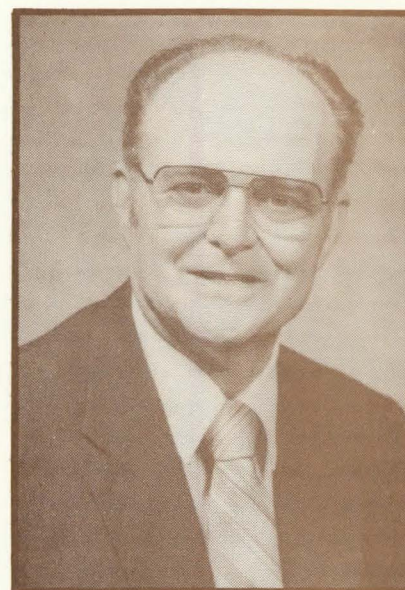
—On Nov. 7, Chief Engineer Wayne Muri announced that Mickes would be promoted Jan. 1, 1987, to assistant to the chief engineer-operations.

R. Ken Stalcup

District 7 Engineer

R. Ken Stalcup, former assistant division engineer-materials, testing, was promoted to District 7 engineer in Joplin March 1. He replaced Joseph A. Mickes who was promoted to Maintenance and Traffic Division engineer.

As District 7 engineer, Stalcup oversees highway and transportation work in an 11-county area that includes Barry, Barton, Bates, Cedar, Dade, Jasper, Lawrence, McDonald,



Newton, St. Clair and Vernon counties.

Stalcup, a 28-year veteran, joined the department in 1958 after receiving a bachelor of science degree in civil engineering from Kansas State College.

He has held a variety of positions including engineer trainee; engineer inspector I, II and III; designer II; district materials engineer and field materials engineer supervisor. He has worked in the department's Springfield, Kansas City, St. Louis and Jefferson City district offices and the Materials Laboratory in Jefferson City.

A Professional Engineer, Stalcup, 55, was born in Preston, KS, and was educated in the school system there. He served as an officer in the U.S. Army Corps of Engineers from 1952 to 1955.

He and his wife, Marilea, have three children.



Jack C. Frissell

Planning Division Engineer

Jack C. Frissell, former District 2 engineer, was promoted to Planning Division engineer July 1. He replaced Walter F. Vandelicht who was promoted to assistant chief engineer-operations.

As Planning Division engineer, Frissell oversees the collection and processing of highway data, the research to determine highway needs and the development of the yearly program for highway improvements.

Frissell, 61, joined the department in 1950 after graduating from the University of Missouri-Columbia with an engineering degree. During his career he has held the positions of engineer inspector, plans designer, senior engineer, district engineer assistant, district surveys and plans engineer, reconnaissance engineer and maintenance field liaison engineer. He has worked in district offices in Hannibal, Willow Springs and Sikeston.

A Professional Engineer and registered land surveyor, Frissell was born in Cape Girardeau and educated in the Jonesboro, AR, school system. He served as a navigator in the Army Air Corps during World War II.

Frissell and his wife, Jenella, have two children.



James D. Jackson

District 2 Engineer

James D. Jackson, former assistant division engineer-maintenance, was promoted to District 2 engineer at Macon July 1. He replaced Jack C. Frissell who was promoted to Planning Division engineer.

As District 2 engineer, Jackson oversees highway and transportation operations in the 11-county area that includes Adair, Chariton, Grundy, Linn, Livingston, Macon, Mercer, Putnam, Randolph, Schuyler and Sullivan counties.

Jackson, 49, began his career with the department in 1959 following his graduation from the Missouri School of Mines, Rolla,

with a bachelor of science degree in civil engineering. He worked for the department during his college years as a student in the Cooperative Engineer Training Program.

During his career, Jackson has served as an engineer inspector I and II, senior engineer I and II, district traffic studies engineer, maintenance superintendent, traffic studies and corrections engineer, maintenance and traffic engineer and field liaison engineer-maintenance.

A Professional Engineer, Jackson was born in St. Joseph and educated in the school system there. He served in the U.S. Army Corps of Engineers for a six-month period in 1960.

Jackson and his wife, Willadean, have three children.

Walter F. Vandelicht

Assistant to the Chief Engineer — Operations

Walter F. Vandelicht, former planning division engineer, was promoted to assistant chief engineer-operations July 1. He replaced Carl Klamm who retired.

Vandelicht oversees the activities of the divisions of Maintenance and Traffic, Equipment and Procurement, Construction and Materials and Research.

Vandelicht, 60, is a 1949 graduate of the University of Missouri-Columbia, where he received a bachelor of science degree in civil engineering. He joined the department that same year as an assistant plans designer in District 5.

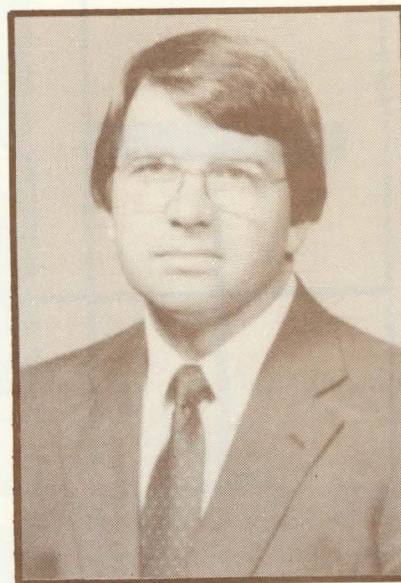
During his career, Vandelicht



has also held the positions of plans designer, plans designer III, chief designer, district surveys and plans engineer, district engineer assistant, senior engineer III, urban planning engineer, assistant division engineer-highway planning and traffic, assistant director of planning-research and traffic, assistant division engineer of planning-research and traffic and District 1 engineer.

Vandelicht was born in Steedman and educated in the Steedman and Mokane schools. He and his late wife, Alice, have three children.

—On Nov. 7, Chief Engineer Wayne Muri announced that Vandelicht would be promoted Jan. 1, 1987, to assistant to the chief engineer.



Rich Tiemeyer

Chief Counsel

Rich Tiemeyer, former assistant chief counsel, was named chief counsel by the Highway and Transportation Commission. He succeeded Bruce Ring, who retired Nov. 1.

Tiemeyer, 37, joined the department as an assistant counsel in 1974 and was named assistant chief counsel in June 1982. He graduated from the University of Missouri-Columbia in 1970 with a bachelor of arts degree in psychology and received his juris doctorate from there in 1973.

He is involved with several legal organizations including being secretary of the American Association of State Highway and Transportation Officials' Legal Affairs Subcommittee.

Tiemeyer was born in Maryville and was educated in the Rock Port school system. He is married to Toni Messina.



Christ Lutheran

Christ Lutheran

Christ Lutheran is a small church with a simple design. The interior is decorated with a few flowers and a small altar.

Services

Services are held every Sunday at 10:00 AM. The church is open for visitors and is a warm and welcoming place.

Location

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Highlights



Commission Takes to the Road

The Highway and Transportation Commission has taken to the road to become better acquainted with highway needs throughout Missouri. Regular monthly commission meetings



The Missouri Highway and Transportation Commission began traveling to the department's districts to hold monthly meetings in 1986. Hannibal was the first stop on the commission's tour.

Department Sets Level on Salaries, Employees

In a move designed to combat a weakening financial situation, the Highway and Transportation Commission decided Aug. 1 to keep the number of employees and the amount spent on the payroll for the department at current levels.

Commission Chairman John C. Cozad says the commission took the action because there is not enough state money available to

have normally been held in Jefferson City. However, eight out of the 12 commission meetings each year will now be held in locations around the state, with every third meeting returning to the capital city.

Commission Chairman John C. Cozad says that holding commission meetings around the state gives the commission an opportunity to hear from people and leaders in the various communities and the opportunity to explain what is anticipated for highways and transportation. He hopes these meetings will make the commission and the department more effective.

The meetings around the state also provide an opportunity for the commissioners to meet with district employees and keep them up to date on department decisions. During 1986, Hannibal in District 3 hosted the first traveling meeting Sept. 5, with St. Joseph in District 1 hosting a Nov. 7 meeting.

Commission meetings have been held outside of Jefferson City in the past, with the last meeting taking place in September 1965 in Kansas City.

the department to allow for additional employees and salary payouts.

"We'll have to make do with what we have," he says. "We plan to achieve employee reductions through attrition and normal turnover, not through layoffs or drastic personnel measures."

This employee and payroll containment continued through the year into 1987, based on regular reviews of the department's financial situation.

The department has pared its staff significantly in recent years, going from a high of 6,900 in 1970 to the more than 6,100 employed today.

Innovations '86 Celebrates Ingenuity

Some people traveled to Expo '86 in Vancouver to see the latest technology. But department employees didn't have to go that far.

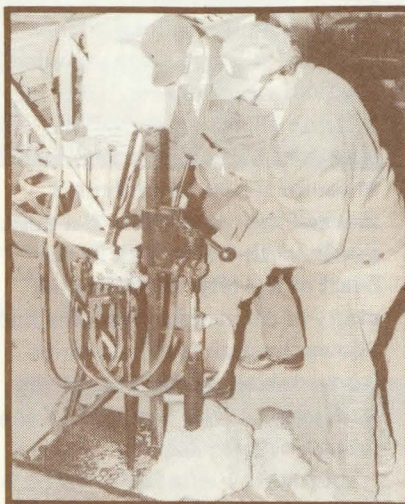
"Innovations '86" came to the department Nov. 5! Sponsored by the Maintenance and Traffic Division, this exposition of new department technology featured everything from homemade equipment to innovative office procedures.

The Missouri State Fairgrounds at Sedalia was the site of the extravaganza, with all districts being represented. More than 300 employees visited the exposition, and this was the first time in department history that all maintenance area supervisors gathered together.

District 10 Engineer Roy Coplen says he thought the exposition was an excellent show. "It brought out a lot of good ideas, but there's also a side benefit to it. Area supervisors got to rub elbows with their counterparts

from other districts. Anytime you get those guys together, it's beneficial."

There was no formal program, so everyone could view the wide variety of displays at his own pace. The Coliseum and one of the cow barns housed the equipment, including such items as a cherry



Richard Dunham (left), highway maintenance supervisor, and Charles McEanahan (right), maintenance crew leader, of District 4 demonstrate the hydraulic core drill they invented to make holes in bridge decks to help drain the pavement.

picker for a backhoe, guardrail post driver and a winter mix heater. Computer programs, safety exhibits and filing systems were some of the items featured in the Commercial Building.

The exposition also featured new and unusual commercial equipment, such as the Sno-Go



Glenn Hastings, District 3 maintenance crew leader, shows District 6 Engineer Frank Kriz how the bar and wick on the herbicide sprayer operates. The spray tank equipment mounted on the back of the truck was made by District 3 personnel, while the spray bar with its wick was bought commercially.

snowblower, that only a few of the districts use.

Gene Swanigan, District 5 special maintenance supervisor, says he enjoyed the exposition. "I saw people I hadn't seen in 20 years! It's a good way to exchange ideas, and we should follow through on them."

Assistant Division Engineer-Maintenance Clif Jett calls the exposition a success, and says he expects future shows to be held every two to three years.

Maintenance Division Engineer Joe Mickes adds, "Innovative ideas have always been welcome, but at a time when our finances are tight, they are critical. We expect this program to be beneficial to our employees and the department."



Innovations '86 was an extravaganza of equipment, inventions and new ideas. The Coliseum on the Missouri State Fairgrounds housed the large equipment, while the Commercial Building was the site of procedures and office equipment displays.

Road Opening Revelry

The year 1986 could well be remembered as the year of the opening ceremony! The department completed many projects, large and small, and many cities, large and small, helped celebrate the improvements. Several of the more notable openings included the following projects:

Route 13, Richmond—The opening of a four-mile segment of Missouri Route 13 on June 2 marked the completion of a major north-south traffic link in the heart of the city. It eliminated many of the traffic pressures and allows through traffic to move across town without congesting local streets. The total cost of the project was \$6,602,300.

Interstate Route 229—This 4.9-mile segment of highway was the fourth link of the West Belt to be opened. Of the total 14.7 miles planned for this highway, 11.4 miles are now open with the final segment expected to be completed in 1987. The total cost of this project, which opened June 4, was \$18,347,782.

Route 50, Jefferson City—The June 11 opening of a 3.627-mile segment of highway, including a major intersection revision near the Capital Mall, relieved

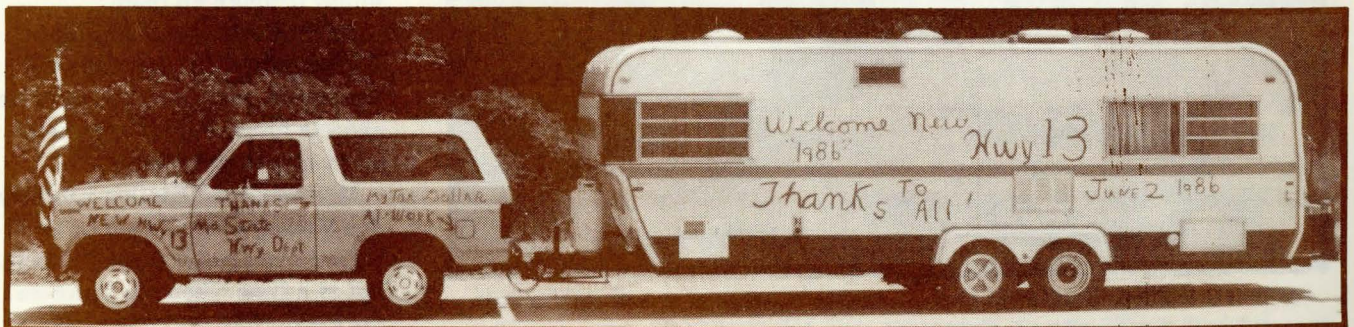
congestion and eliminated accident-prone intersections with city streets. The total cost of the project was \$12,071,940.

Route 71A, Carthage—The final section of the Carthage Relocation south from Missouri Route 96 opened to traffic July 14. The total cost for this four-mile project was \$13,157,230.

Interstate Route 670, Kansas City—This 4,420-foot project, which consisted mainly of bridges and ramps, is dubbed the Dillingham Freeway. Opened on July 30, this improvement provides a connection to the West Bottoms, the central industrial district, the stockyards and Kemper Arena. The total project cost was \$37,862,119.

Route 54, Callaway County—A seven-mile relocation of U.S. Route 54 between Holts Summit and New Bloomfield opened to traffic Aug. 29. Completion of the improvement marked one more step in the overall plan to upgrade Route 54 between Jefferson City and Mexico. The total cost of the project was \$11,044,171.

Route 63, Columbia—The Sept. 29 opening of about two miles of highway in Columbia represented the halfway mark in the bypass plan. This segment relieved traffic congestion on Route 63 and Route B in the city. The total project cost was \$6,609,000.



A four-mile stretch of Route 13 at Richmond opened June 2, and Eddie McKown expressed his appreciation enthusiastically! McKown lives at the north end of the

project and had watched construction progress since work began in early 1984.



A highlight of the festivities at the Heart of America bridge opening, Thursday, Oct. 16, was the completion of the center-line stripe on the bridge. Assistant Division Engineer-Operations Walt Vandelight (center) was one of several officials and dignitaries who put down the paint.

Route 60, Mansfield—The opening of this 1.2-mile stretch of highway represented the last of three connecting projects, making Route 60 from Springfield to Cabool a dual-lane facility. The total cost of this project, which opened Sept. 30, was \$4,091,405.

Route 36, Brookfield—The Oct. 2 opening of 3.7 miles of highway completed another phase in the plan to upgrade and develop Route 36 across northern Missouri. This improvement provided a new entrance to Brookfield, eliminating the grade crossing at Route 11. The total project cost was \$7,788,197.

Heart of America Bridge, Kansas City—The Heart of America Bridge on Route 9 opened Oct. 16 to replace the delapidated traffic decks on the ASB Bridge. The total cost of this project, which took more than five years to complete, was \$65 million.

Interstate Route 435, Kansas City, MO, KS—The Dec. 17 opening marked the completion of the final segment in Interstate 435, which encircles Kansas City, MO and Kansas City, KS. This



The department opened a five-mile segment of Interstate Route 229 on June 4. District 1 Engineer Don Hiatte explained the features and benefits of the new section to a reporter from KQTV, St. Joseph.

segment connects Missouri and Kansas and provides easier access to Kansas City International Airport. Began back in 1962, Interstate 435 is 83 miles long through Missouri and Kansas and cost \$510 million to build.

Gramm-Rudman Grabs Highway Funds

The federal government's deficit-cutting measure, the Gramm-Rudman-Hollings Act, cut into the department's budget during 1986. Chief Engineer Wayne Muri estimates that the department lost about 4.3 percent or \$10.3 million in highway funds in federal fiscal year 1986, which ended Sept. 30, because of this measure.

The department usually receives about \$257.5 million in federal funds yearly. These funds come to the state through the Federal Highway Administration, the Urban Mass Transit Act, the Federal Aviation Administration and the Federal Rail Administration.

The department's transportation functions also felt the cut of Gramm-Rudman-Hollings. Transit lost \$202,000, and aviation lost \$100,000 during fiscal year 1986.

Muri notes that these figures do not include federal airport and transit funds that go directly to St. Louis and Kansas City transit systems and primary airports.

High Waters and Highways

The rains came.
The waters rose.
The rivers flooded.
The roads closed.

Missourians witnessed some of the worst flooding in their history during the first part of October. The state's highways fell victim to torrential rains, along with more than 7,300 people who were forced from their homes.

Districts 1, 4 and 5 were hit hardest by the floods, although closings were reported from most



"Rising Fast" is exactly what Davis Creek did near Sweet Springs in District 4. Flooding limited Interstate 70 to truck traffic in the beginning, but as waters rose, the highway was closed completely to through traffic.

every district. At the peak of the flooding, Oct. 3, 162 sites in 55 counties were closed.

Even the invincible, or so it seems, Interstate system couldn't overcome the high water as I-70 was closed in two places. Davis Creek at its peak was 2 feet over the highway near Sweet Springs in District 4. Near Boonville in District 5, Chouteau Creek was the flooding culprit with about 5

feet of water over the road at its peak.

Flooding limited I-70 to truck traffic in the beginning, but as the waters rose, the 100-mile stretch from Kingdom City to the Higginsville exit was closed completely to through traffic.

Detours directed this traffic across the state on Route 54, 50 and 13. Local and county law enforcement agencies along with the Missouri State Highway Patrol worked to keep traffic moving along the detours.

The last time I-70 was closed because of flooding was in 1973 when Chouteau Creek and Martins Branch covered the highway near Boonville.

The most serious damage due to highway flooding occurred on Route 47 near Marthasville in Warren County. The highway remained closed as crews worked to repair almost 200 feet of the road that was washed away by waters from the Missouri River.

However, most of the highway damage from the flooding was minimal.

For Maintenance employees, the floods meant long hours of closing roads, putting up detour signs, clearing drift from bridges and placing object markers along highways to guide traffic through low water.

Another kind of traffic was also disrupted by the flooding. Amtrak train service between Kansas City and St. Louis halted Oct. 4 because flood waters washed out a bridge in Otterville and more than 200 feet of track in Hermann. Service along the 279-mile route resumed Oct. 9.

The rains stopped.
The rivers did crest.
The highways reopened.
We had met the test.

Construction Lettings Canceled

The department canceled two construction bid lettings because of a money shortage during 1986. Chief Engineer Wayne Muri says the August and September lettings were canceled because the department had used all its federal highway funds and did not have enough state money to undertake any more construction projects.

The last time a construction bid letting was canceled was in August 1979. Bid lettings are normally held monthly except December.

However, the department was able to hold October and November lettings because of a limited release of federal funds. This money was apportioned to Missouri by the Federal Highway Administration and was an advance on 1987's federal funding allocation. It came from the Federal Highway Trust Fund through a Congressional continuing resolution.

Almost all Missouri highway construction projects are funded by a combination of state and federal money. The ratio of funds depends on the type of project.

Federal funds are generated by the 9-cent per gallon motor fuel tax, while a large part of state funds come from the state's 7-cent per gallon motor fuel tax.

The department continually projects funding trends so there will be enough money available to pay for highway construction work as it progresses. Since some projects take several years to complete, Muri says, the total contract cost is not paid out at once, but in stages as the work progresses.

Missouri Takes First on Worst List of Bridges

Missouri now leads the list of 50 states with the highest percentage of deficient bridges. With 64 percent of all its highway bridges either structurally deficient or functionally obsolete, Missouri became the best of the worst list in the National Bridge Inventory published in 1986.

Each year, the states submit an evaluation of their highway bridges to the U.S. Department of Transportation, which reports the findings to Congress. In the most recent bridge inventory, 42 percent of all highway bridges in the nation were deficient.

In Missouri's case, the state has more deficient bridges than the total number of bridges in any of 34 states. For example, Missouri has 15,221 deficient bridges, while

all the bridges in Arkansas number only 13,137, and only (only!) 48 percent of Arkansas' bridges are rated deficient.

"The fact that a bridge is deficient either structurally or functionally does not imply it is unsafe," the report on the bridge inventory says. "With proper load posting and enforcement, many structurally deficient bridges can continue to serve most traffic. Functionally obsolete bridges often have geometric deficiencies that can be minimized by the use of roadway striping, signs, signals and crash cushions."

For purposes of the National Bridge Inventory, the U.S. Department of Transportation defines "structurally deficient" as those bridges that are restricted to light traffic, require immediate attention to remain open or are closed to traffic. One out of every four bridges in the inventory are structurally deficient. Many of these bridges are functionally obsolete as well, but are not included in that category.

A "functionally obsolete" bridge's deck, load carrying capacity, clearance or approach roadway alignment no longer meets the usual criteria for the highway system of which it is a part. One in five of the country's bridges are functionally obsolete.

Progress has been made during the past year in improving the nation's bridges, but at a glacier pace. The percent of deficient bridges went from 45 percent in last year's inventory to 42 percent this year. At the same time, Missouri moved from second place to first in the percentage of deficient bridges.



Route 72, Madison County, St. Francois River

Interstate System Celebrates 30 Years

Three decades and counting.

In August 1986, the American Interstate Highway System became 30 years old.

And it got its start right here in Missouri!

It was Aug. 13, 1956, when construction got underway in St. Charles County for a 2.6-mile stretch of the Mark Twain Expressway (Interstate 70). And from these humble Missouri beginnings sprang more than 43,000 Interstate miles . . . the largest public works project in the history of mankind.

Technically speaking, the Interstate system was born several weeks earlier. On June 29, 1956, then-President Dwight Eisenhower signed the Federal-aid Highway Act into law. The legislation provided for the National System of Interstate and Defense Highways (the Interstate system's official name) and also established the Highway Trust Fund. Supported by federal taxes (mainly a gasoline tax) on those

who use the highways, the trust fund would finance 90 percent of Interstate construction, with states funding the remaining 10 percent.

Those plans have all come true in the past 30 years. The Interstate system now covers more than 43,000 miles nationwide, with 1,142 miles now in operation in Missouri. "The Interstate is a tremendous asset to the state," says Wayne Muri, chief engineer for the Missouri Highway and Transportation Department. "It handles traffic more safely and with much less delay."

Construction of the Interstate system has cost more than \$110 billion overall, and expenses in Missouri are over the \$2.6 billion mark. But the long building process is practically over. Nationwide, the system is 97 percent complete, and 98 percent of the Missouri Interstate is finished.

When completed, the Interstate will comprise slightly more than one percent of America's roads, yet it already carries more than 20 percent of the highway travel. And its social and economic importance to business, industry and the average driver is far greater than those figures suggest.

Motor vehicle travel in the United States has soared from about 600 billion vehicle miles a year when the Interstate was begun to more than 1.7 trillion vehicle miles a year today, more than one-fifth on Interstate roadways.

And the Interstate system is in even greater demand these days in Missouri. Of the 28.5 billion miles driven on state roadways last year, more than 10 billion was covered on the Interstate. That's more than 35 percent. "There's no doubt about it," Muri says. "The Interstate has opened



up tremendous travel and significantly developed the accessibility of many areas."

The Missouri Interstate system is comprised of I-70 in the center of the state, I-44 to the south, I-55 in Missouri's southeast corner, I-29 and I-35 to the northwest and several offshoots in Kansas City and St. Louis and in several other areas.

The jump in traffic flow statewide created by the Interstate has benefited area tourism and economies as well. "The system has made economical delivery of goods simpler and has also created opportunities for development along Interstate corridors," Muri says.

But perhaps the most

When completed, the Interstate will comprise slightly more than one percent of America's roads, yet it already carries more than 20 percent of the highway travel.

significant result of Interstate development has been the added degree of safety that comes with it. Although it carries 35 percent of total miles driven, only 20 percent of accidents occur on Missouri Interstates. And when fatalities are concerned, Interstate highways are about three times safer to drive in Missouri, based on figures concerning fatalities per miles driven.

Perhaps the 43,000 miles of Interstate highway put together in this country in the past three decades is put into better perspective when compared to what other countries have been able to accomplish. For instance, there are only slightly more than 5,000 miles of similar roadway in Germany, and France and Italy have a little over 3,700 miles. Only Australia has more than 10,000 miles of such top quality highways.

So what was started innocently enough in Missouri 30 years ago has turned into quite an impressive transportation system . . . probably the safest and most comprehensive and convenient way to get from place to place in the world.



Adam Myers paid a visit to a fishing tournament co-sponsored by Districts 3 and 6. Will Goodwin, general manager of the Black Jack Marina, where the tournament was held, gave Adam a lift so he could get a better view of the fish.

Employees Offer a Helping Hand for a Heart

There was a special little boy in the department's life during 1986. His name was Adam Myers. He gathered a little piece of everyone's heart across the state, all in the effort to help Adam receive a new heart.

Adam was born with a large hole in his heart. He is only three years old, but he's undergone open heart surgery, numerous testing procedures and various medications, all of which in the end will not save his life. He needs a heart transplant.

Adam's father, John, is a maintenance crew leader in District 3. He and his wife needed \$100,000 before Adam could have his heart transplant, and they will need thousands of more

dollars to pay for additional transplant costs and the medicine that Adam will have to take for the rest of his life. He is a transplant candidate at the Texas Heart Institute in Houston.

During the year, employees from every district and division joined together to help. They sponsored softball and fishing tournaments, they washed cars, they cooked chili luncheons, they held auctions, and they gave away trips and cash in a raffle. But most of all, they gave of themselves.

And their fund-raising efforts worked! Department employees contributed almost \$50,000 to the Adam Myers Trust Fund. The fund has reached its \$100,000 goal, however money is still needed for the additional costs. Thanks to a little help from his department friends, Adam's dream of a new heart will soon be a reality.

Operations



Employee Suggestion System Awards Presented

Three employees were honored during 1986 by the Missouri Employee Suggestion System and the Missouri Highway and Transportation Department.

G. Eddy Arndt, highway maintenance supervisor in District 7, was recognized for his suggestion to improve a three-wheel pull broom to a two-wheel unit by installing a hydraulic tongue hitch. According to Bill Shaw, assistant to the chief engineer-planning and design and departmental coordinator of the program, Arndt's suggestion

refocused attention on this helpful modification.

Wilbur L. Stephens, maintenance crew leader in District 1, was also recognized for bringing attention to the need for an easier way to turn heavy barrels that store striping paint. Stephens is credited with being the father of a hydraulic barrel handler that is used with a forklift.

The department is determining if each of these helpful inventions can be purchased commercially. Arndt and Stephens received a certificate signed by Governor John Ashcroft and Chief Engineer Wayne Muri and two days paid vacation for their suggestions.

Ralph Thater, field materials engineer at the Materials Laboratory, was also honored by the program for his suggestion to indicate the population base of counties on the state highway map. This suggestion was received too late for the information to be included on the new map, but it will be included in later editions. Thater, also received a certificate signed by Governor Ashcroft and the chief engineer and one day paid vacation.

The Employee Suggestion System is administered by the Office of Administration in cooperation with other state agencies. A suggestion is submitted to the Office of Administration and then forwarded to the related agency or department. This department then evaluates the suggestion on its ability to save money, increase revenue or improve the quality of service.



G. Eddy Arndt (right), Adrian, received a certificate recognizing his contribution to the Missouri Employee Suggestion System from Bill Shaw (left), assistant to the chief engineer-planning and design. District 7 Maintenance and Traffic Engineer Jim Minton (far left), District 7 Engineer Ken Stalcup (second from right), Maintenance Area Supervisor Ed Swopes (right) and members of the Adrian crew were on hand for the presentation.

"Top Guns" Trained to Teach

The "Top Guns" of gravel road maintenance were chosen during 1986. Nineteen employees participated in the Gravel Road Maintenance Workshop Program, a cooperative effort between the Transportation Technical Assistance Office (TTAO) of the University of Missouri-Rolla and the department.

Each district selected their best motorgrader operator and nine districts selected a maintenance area supervisor to help train employees of local and county governments in gravel road maintenance procedures and grading techniques.

The workshops were a one-day session. The morning was devoted to classroom activities that covered the basic components of a good gravel road. The maintenance area supervisors

discussed proper road maintenance procedures.

In the afternoon, the motorgrader operators conducted field demonstrations on a nearby gravel road to explain the proper blading techniques.

Charles Dare, TTAO director, says, "There are two important features of this workshop. People who are involved from the department have the practical experience and can demonstrate the equipment, and they're also familiar with local conditions. Missouri is a diverse state, and we need to have someone who knows the local problems and the area."

Chief Engineer Wayne Muri complimented the group. "These extra efforts to promote goodwill between the department and other government agencies are invaluable. The positive image put forth by employees such as yourself is highly commendable and greatly appreciated."

The employees presented several workshops during the year, and the program continued into 1987.

JB Bridge Receives Discretionary Funds

The department received almost \$15.5 million in federal Interstate highway discretionary funds in early 1986. This money was designated for work on the new eastbound Interstate Route 255 (Jefferson Barracks) bridge across the Mississippi River in southern St. Louis County.

Chief Engineer Wayne Muri says these funds are granted to states at the discretion of the secretary of the U.S. Department of Transportation and are in addition to normal federal funding allocations.

Muri says the money will provide for completion of the substructure and for fabrication and erection of the structural steel.

A new westbound bridge was opened to traffic in July 1984, and the old bridge was demolished in 1985. The eastbound bridge will carry three lanes of traffic when it is completed in the next two-and-a-half years. The total cost of both bridges is estimated at \$58 million.

The Jefferson Barracks Bridge is a joint project with the State of Illinois. Muri says the Illinois Department of Transportation, which also received discretionary funding for this project, will supervise the construction work.

Muri says the department requested discretionary funding for the project and was able to take advantage of the money because the current phase of the project is ready for bidding.



Employees who helped train county and city employees in gravel road maintenance were: (First Row, left to right) Billie Hamby, 7; Henry Horton, 10; Johnny Ragsdale, 8; Jim Houk, 8; J.C. Jones, 3; Royce Smith, 1; Harley Vaughan, 5; and Ralph Young, 9.

(Second Row, left to right) Jay Jordan, TTAO; Clif Jett, MO; Dale Cooper, 7; Vic Gardner, 3; Bob Charles, 4; Don Berendzen, 5; Joe Mickes, MO; George Gardner, 4; and Wayne Muri, MO.

(Third Row, left to right) Dale Boxley, 2; Don Havener, 6; Bill Livers, 6; Harold White, 9; Charles Dare, TTAO; and Jim Jones, 1.

State Fair Features Fresh Format

You can bet that parimutuel horse racing wasn't the only new thing at the Missouri State Fair in 1986. It was a "new and improved" Highway Gardens that greeted the more than 300,000 visitors during the fair's run, Aug. 15-24.

In the gardens' building, the department featured new, detailed photogrammetry and archaeological exhibits from the Surveys and Plans Division. This exhibit was two years in the planning and making, with the Public Information Division also providing support in the venture.

Mike Stelzleni, photogrammetric engineer, headed up the photogrammetry exhibit, which explained the various procedures involved in the process, including ground surveying, aerial photography and contour mapping. Visitors

especially enjoyed seeing the enormous camera used in aerial photography, looking through the stereoscope and trying their hand at the kelsh plotter used to make the contour maps.

Ron Clark, Jim Roach and Fred Taggart helped produce the photogrammetry display. Alan Cliburn, Joe Duenkel, Bob Hartman, Dennis Hopkins, Grace Lorts, Geri Morton and Lanny Strickfaden took turns manning the display during the fair's run.

Department Archaeologist Dave Crampton developed the archaeology exhibit and put it together. Other staffers who contributed to the project included Archaeologists Mark Kross and Russ Miller and Randy Dawdy, Will Brame, David Austin, Pat Trader, Elaine Geller and Theresa Piazza. Excavation teams from the University of Missouri-Columbia and Luther College, Decorah, IA, also uncovered several artifacts used in the display.

This exhibit explained the stages of an archaeological dig and its importance in the highway building process. A giant yellow map pinpointed current digs, and artifacts displayed in glass cases attracted attention from exhibit visitors.

The highway gardens also sported a newly improved lily pond near the building. During the year, maintenance employees worked to pave a new walkway around the lily pond and to pour and paint its new concrete channel and pool. Both visitors and goldfish enjoyed the pond's new look!

But not everything was new! There were still the old lily favorites to delight visitors. This year's flowers and pads were some of the largest the gardens have ever had. The ponds were lit by the blooms of the white Missouri, the blue Henry Shaw and the green pad of the Victoria



The department's archaeology exhibit featured panels that explained the phases of a dig. Visitors enjoyed strolling along the display and viewing artifacts from various excavations throughout the state.

that spread its large diameter over the water.

And two other old favorites continued to interest garden visitors. The department's retired 1936 snow blower and the Highway Patrol's "Otto, The Talking Car" attracted plenty of attention and curious looks.

Construction Costs Decrease

If you built a state highway in 1986, you paid a half of one percent less to do it than you did in 1985, according to figures compiled by the department.

The cost decrease is attributable to lower bid prices received on construction materials such as concrete and steel and on construction activities such as earthmoving, Chief Engineer Wayne Muri says.

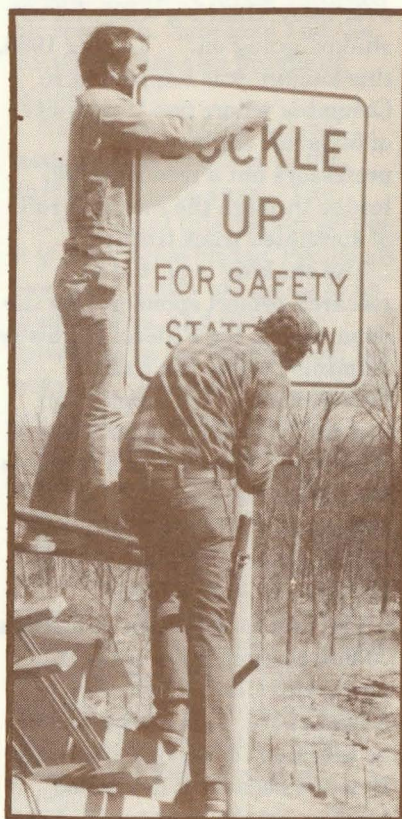
During 1986, the department took bids on 217 projects worth \$189.4 million. During 1985, bids were taken on 332 projects worth \$357.6 million. The August and September 1986 bid lettings were canceled because Congress had not passed a bill allocating federal highway funds to the states.

Muri points out that construction cost figures are obtained through an index system that assigns point values to several categories of construction activities, not by the number of projects and their corresponding worth.

The number of bids per project increased from 3.76 per project in 1985 to 4.60 in 1986.

The department holds regular highway bid openings monthly except December.

Department Places Buckle-Up Signs



Maintenance Crew Member Richard Huff (left) and Maintenance Crew Leader Jim Norment erected a seat belt sign at the Mineola Rest Area on Interstate 70 during 1986.

During 1986, motorists traveling Missouri's highways were reminded to buckle up. The department installed signs asking motorists to comply with the state's seat belt law.

The signs were placed at the state line on all numbered routes and near the rest areas along the Interstate routes. The black and white signs are 36 inches wide by 42 inches high and feature the words "BUCKLE UP FOR SAFETY - STATE LAW."

Chief Engineer Wayne Muri says, "The signs let out-of-state travelers know they need to buckle up, as well as remind Missouri motorists of the law. Our department has an obligation to make the highways as safe as possible for motorists," Muri continues, "but the motorists must also play a part in safe travel. We hope these signs reminding them to use their seat belts can help in this effort."

Missouri's seat belt law became effective Sept. 28, 1985. Fines will be imposed after July 1, 1987. All front seat occupants must be secured by a seat belt. All children under four years old must be secured in an approved child safety seat in the front or with a seat belt in the rear of the vehicle.

A Whole Lot of Shakin'

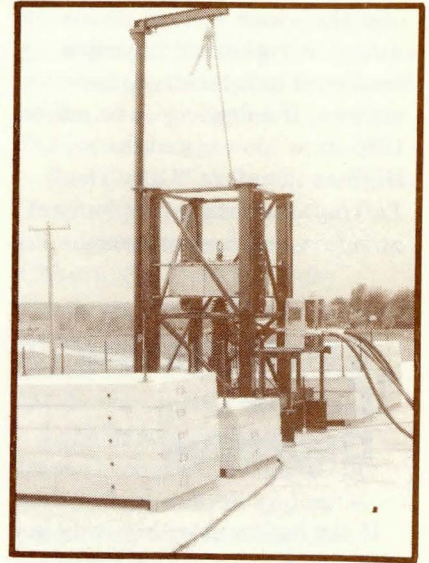
In the immortal words of the Jerry Lee Lewis song, "Come on over baby, there's a whole lot of shakin' going on." During 1986, this shakin' was happening in Columbia where two University of Missouri engineering professors put a reconstructed bridge through the rock and roll of simulated truck traffic!

The shaking is part of a research project sponsored by the department, the Federal Highway Administration, the Kansas Department of Transportation and the Nebraska Department of Highways. Through this research, Dr. James Baldwin and Dr. Harold Salane hope to discover repair methods that could help bridges across the nation.

The project specimen contains a 70-foot section of the old I-70 Lewis and Clark Viaduct in Kansas City. This bridge had to be taken out of service after only 18 years because it developed hairline cracks at about 80 percent of its joints, creating a risk of collapse. The average life of a bridge is 50 years.

"Take a piece of wire and bend it back and forth with just tiny bends," says Baldwin. "After several times it will eventually break in two. This is the same kind of phenomenon that caused the cracks in the bridge girders."

There are currently about 4,000 bridges across the country that were built with this same design during the late 1950s and early 1960s. Other states have experienced similar problems with this type of bridge. The bridge is made of two steel girders with smaller floor beams connecting the girders. This design has since been abandoned by the Federal Highway Administration.



A hydraulic ram pounds the loaded bridge at four cycles per second to simulate truck traffic. The professors hope to find ways of preventing and repairing cracking that daily traffic can cause on this type of bridge.

The professors will shake the test bridge until it develops cracks similar to the ones that occurred when the more than 67,885 vehicles crossed it daily. After the cracks develop, the professors will repair the bridge using different methods. Then the shaking will start all over to see which methods work best.

The site preparation and planning work on this project began during the summer of 1984. The test bridge was trucked to the University South Farms in early 1985 and the actual shaking began in late April 1986.

The truck traffic is simulated by using a hydraulic ram that pounds the bridge at four cycles per second. The 80,000-pound truck in this case is forty 2,000-pound concrete slabs that are stacked on the bridge in the configuration of a truck. A crane moves the slabs to different sections of the bridge.

When the ram is pounding full speed, the bridge isn't the only one that feels the effects! The

ground around the bridge and anyone who's nearby shakes with the rhythmic thunder.

The professors currently have about 140 gauges connected to the bridge to measure different factors such as deflection and stress during the testing. Deflection is the movement of a bridge up and down, while stress is the pressure placed across a bridge by the load.

"We add more gauges as we see the need for them. We're observing the behavior of different parts of the bridge, so in the process if we see something happening that might help us out, we'll put a gauge on it," says Baldwin.

The electrical readings from the gauges are then transmitted to a computer where the voltages are converted into numbers. This computer nerve center is housed in a truck trailer beside the bridge. Here the professors control the shaking of the bridge and monitor the results. The inside of the trailer resembles a high-tech doctor's office. One screen that shows the bridge deflection even looks like a

heartbeat monitor.

The total cost of this research project will be more than \$200,000. Missouri and Kansas are contributing the largest portion of the money using federal highway funds allocated for research. Nebraska and the university are also providing funds.

Art Rhodes, bridge special assignments engineer in the Bridge Division, says, "The uniqueness of this project is that it is a full-scale bridge. People all over the country are going to be watching us, and they'll be interested in the results from this research." Rhodes is a member of the project's advisory panel.

The professors' research will continue into 1987 until the cracks develop and repair methods are tested. From their test results, Baldwin and Salane hope to be singing the sweet song of success. The "shake, rattle and roll" will be worth it if the professors can discover methods that can be used nationwide to prolong the lives of similar bridges.

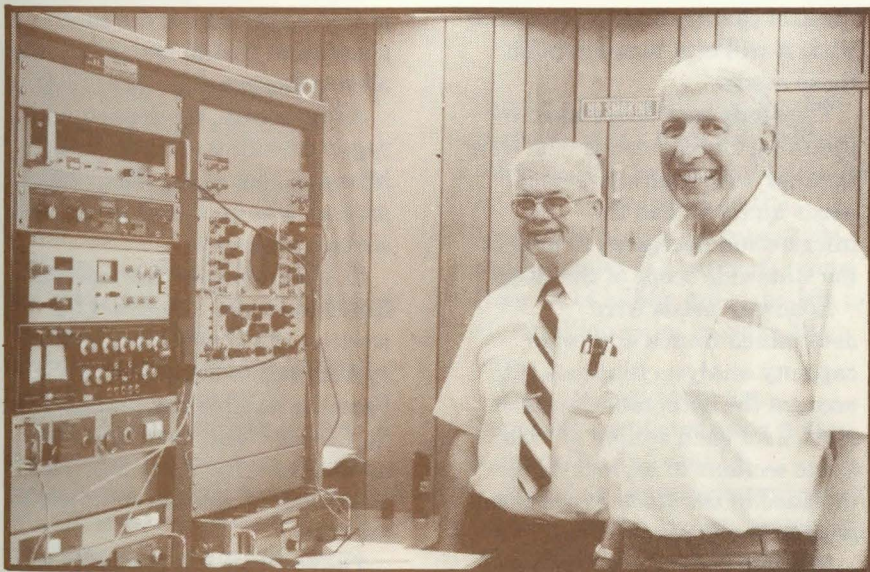
Permit Operations Revised, Updated

The department made several changes that affected overdimension and overweight permits during 1986. These changes included increasing the weight limit, raising the fees and installing a toll-free number to receive permits.

Revised regulations for overdimension and overweight vehicle permits took effect March 16. A major change in these regulations allows a maximum gross weight increase of up to 120,000 pounds under certain conditions. The rules also outline all the steps necessary to move overwidth and overdimension items in the state, as well as what items cannot be moved.

As of Dec. 15, the fees charged for all overdimension and overweight permits increased from \$7 to \$12. Situations that require these special permits include movement of large farm and construction machinery and transportation of building materials like large beams and transformers that fall outside the normal dimension and weight restrictions.

Additionally, the department has put in a larger capacity telephone system with a toll-free number (800-237-5879) to make it easier for intra- and interstate truckers to get the permits they need to haul overweight and overdimension loads.



Dr. James Baldwin (left) and Dr. Harold Salane, University of Missouri-Columbia engineering professors, mastermind the research project from their computer nerve center that is housed in a truck trailer on the project site.

Study Targets Future Highway Needs

Missouri's state highway system encompasses 32,000 miles of roads and almost 10,000 bridges, making it the seventh largest in the nation. Add to this nearly 70,000 miles of county highways and 17,000 of city streets, and you have a 119,000-mile network of highways that serves the state and its citizens.

But that network is not young and vibrant. It has been around for many years, and like lots of things that are getting old, it needs a few repairs and renovations to keep it in operation.

The department is responsible for maintaining the 32,000 miles of highways that comprise the state system. Part of this responsibility includes planning for the future of the highway system. To accomplish this, the department developed a needs study in 1986 to determine what Missouri should be doing with its highway system as we move into the 21st century and to determine what it will cost to accomplish those needs.

The study was undertaken by Planning Division staff who were familiar with highway system needs and who had the information necessary to project the statewide scope of the study.

Roadway needs were determined from a statewide capacity analysis that took into account the acceptable levels of service for each section of road. Some sections of highway were included in the study to complete gaps in the system.

Roadway needs were reviewed with each of the department's 10 district offices. Based on these reviews, some highway sections were added, deleted or adjusted.

Bridge deficiencies were determined from reviewing the condition, width and load-carrying capability of each bridge. All one-lane bridges were to be eliminated.

Resurfacing needs were based on an analysis of the age of the pavement and the expected life for that type of pavement.

The study took into account the development of the highway system from the 1921 Centennial Road Law, which connected all county seats with a primary

The challenge of the study was to prepare the highway system for the next 15 years to accommodate future increases in traffic and keep pace with deteriorating bridges.

highway, through the 1950s and '60s take-over program that brought an additional 12,000 miles of farm-to-market roads into the state system.

Both of these programs got Missouri "out of the mud" and placed 95 percent of the rural population within two miles of an all-weather road.

Additionally, the department began an oiling program to get Missouri "out of the dust" when asphalt was used over all gravel surface highways.

In 1956, Missouri became the first state to let a contract for work on the Interstate highway system and to begin work on it. From its humble beginnings near St. Charles, that system is now more than 1,100 miles long and is more than 98 percent complete in the state.

The challenge of the study was to prepare the highway system for the next 15 years to accommodate future increases in traffic and keep pace with deteriorating

bridges. The study also provides for good riding surfaces, additions to the present system and safety improvements.

Another important consideration was the economic development of the state, and the study provides highway improvements that encourage it.

The price for the highway work in the study was estimated to be more than \$7.8 billion in today's dollars. When inflated over the next 15 years, this figure rises to \$11.6 billion.

The \$7.8 billion is about \$6 billion more than the resources currently available for highway work, however the study addressed only the needs and the cost, not alternative funding sources.

As 1986 came to a close, a grass roots campaign was being waged across the state to build public and legislative support for an increase in funding to improve Missouri's highway system. Private sector groups that support transportation were heading up this campaign and were using the department's needs study to back their request for more funds.

1986 Travel Record Hits All-Time High

Missouri motorists flocked to the open road in 1986 and drove a record 30.1 billion miles, bypassing the previous high set last year by 5.6 percent.

Department Chief Engineer Wayne Muri says travel on the state highway system in 1986 was 30.15 billion vehicle miles, a 1.61 billion mile increase over the 28.54 billion miles driven in 1985.

Travel on the primary system

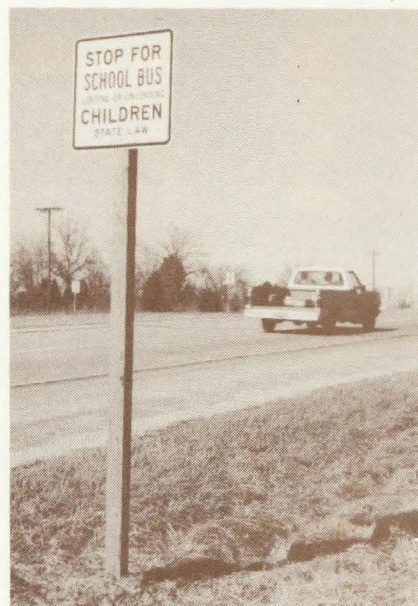
School Bus Signs Help Secure Safety

Thanks to the department, students riding school buses now have an extra margin of safety. Maintenance crews installed additional school bus warning signs along Missouri's state highways in 1986.

Chief Engineer Wayne Muri says the signs, which carry "Stop for School Bus Loading or Unloading Children — State Law" wording, were placed at strategic locations throughout all counties in the state on federal and state-numbered and lettered routes. Signs had formerly been placed only in counties that bordered neighboring states.

"We're concerned that many motorists ignore the law when they encounter buses that are stopped to load or unload children," Muri says. "We have an obligation to make our highways as safe as possible for our citizens. These additional signs are one way of doing that."

State law requires motorists



traveling a two-lane road to stop when they meet or overtake, from either direction, a school bus that has stopped to load or unload students. They must remain stopped until the bus resumes motion or the driver signals them on.

School buses are equipped with mechanical and electrical signals that are plainly visible and indicate the intention of the bus driver to stop.

increased 584 million miles (5.9 percent), going from 9.75 billion miles in 1985 to 10.35 billion miles in 1986, while travel on the Interstate system increased 584 million miles (5.8 percent), going from 10.14 billion miles in 1985 to 10.72 billion miles in 1986, Muri says.

Primary highways are generally numbered state routes such as 61, 36, 7 and 13.

Travel on the supplementary or farm-to-market system increased 443 million miles (5.1 percent), going from 8.64 billion miles in 1985 to 9.08 billion miles in 1986.

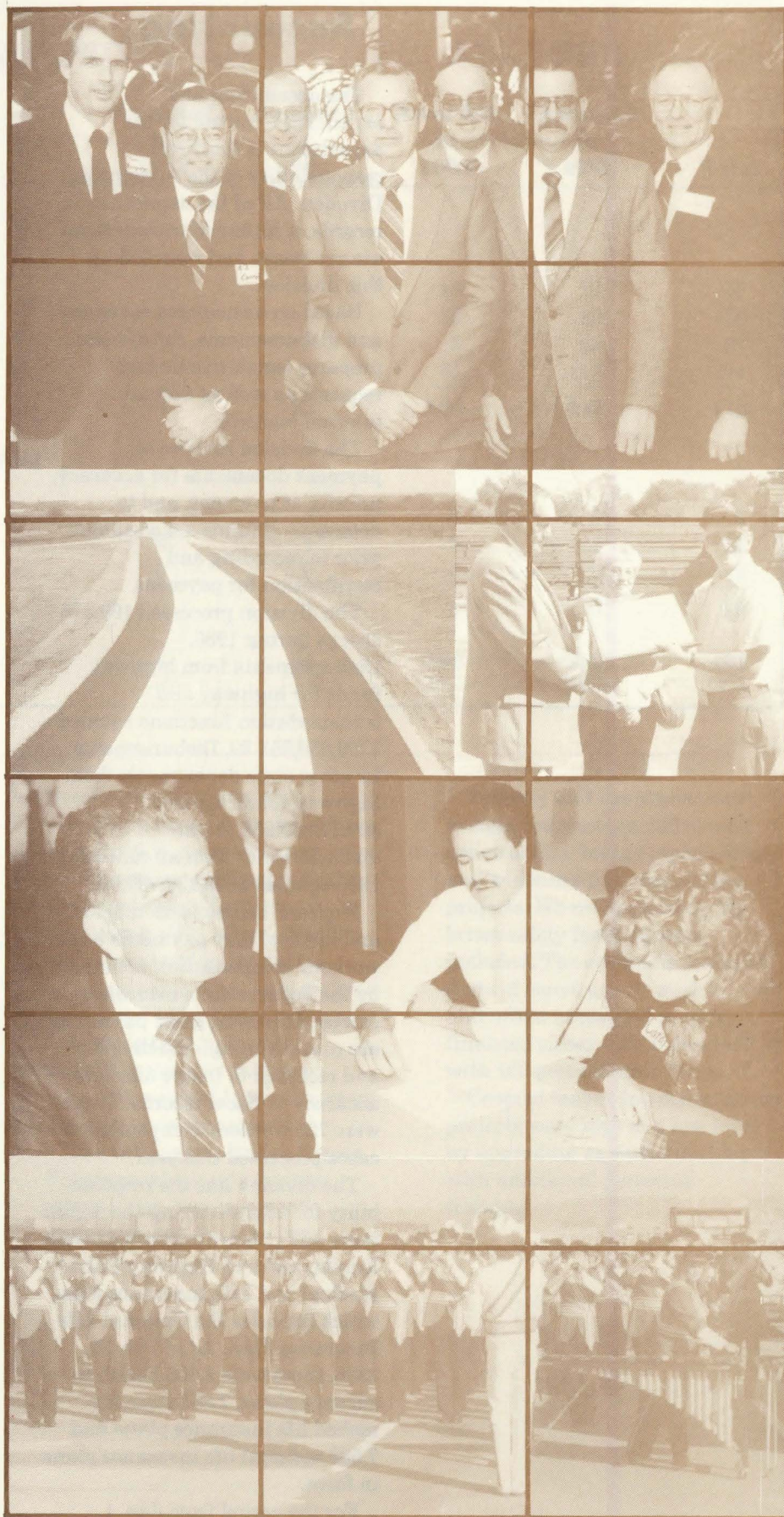
Supplementary highways are generally lettered state routes such as A, B, C and D.

August was the peak travel month in 1986 at 2.78 billion miles, while January was the lowest at 2.14 billion miles.

Muri says the overall travel increase is probably due to fairly stable fuel prices, generally mild weather and the use of more fuel-efficient vehicles.

Traffic volume data is obtained from a number of permanent traffic recording stations the department operates throughout the state.

Divisions



Accounting

The accounting and expenditure control for the department is the direct responsibility of the Accounting Division. All of the department's records of financial transactions are processed and recorded by this division.

Based on anticipated revenues and disbursements, the division prepares legislative budget requests as well as annual internal budgets.

The division reviews all payment documents for accuracy, priority of payment, and to determine if funds are available prior to recording and certification for payment.

The division processed 199,376 checks during 1986. Disbursements from highway funds for highway and transportation functions equaled \$709,650,351.29. Disbursements by other state departments from highway funds equaled \$99,712,593.55. Total disbursements from all funds for 1986 equaled \$825,139,737.99.

Workers' compensation benefits and medical care payments under workers' compensation are made by the department's insurance carrier. However, these payments are routed through the division and recorded to insure absolute accuracy of fiscal records. There were 728 workers' compensation cases processed this year.

The division has the responsibility for administering the regulations and policies of the Highway Employees' and Highway Patrol Medical and Life Insurance Plan, which includes the Optional Life Insurance Plan. As of Dec. 31, 1986, there were 9,905 health insurance plans, 7,881 state furnished life insurance plans and 7,533 optional life insurance plans in force.

For the period from Jan. 1,

1986, through Dec. 31, 1986, there were 29,170 health claim payments with \$10,860,481 paid in benefits. During the same period, there were 23 life claims under the state furnished plan and 29 life claims under the optional life plan with \$301,141 and \$944,977 paid respectively in benefits to survivors.

Bridge

The Bridge Division is responsible for the design of bridge structures on the state highway system.

During the year, 82 designs were completed for letting. Of this number, 49 were designed for major system routes with 33 to be built on supplementary routes.

The total length of all new structures contracted during the year amounted to 16,594 feet at a cost of \$22,252,144. Of these amounts, 4,959 feet were contracted on the supplementary system at a cost of \$5,432,934.

A major structure contracted during the year and included in the above statistics is the renovation of the Route 240 bridge over the Missouri River at Glasgow at a cost of \$2,313,918.

In addition to the designs for new structures, the division prepared 124 designs for repairing, widening or extending 42,150 feet of existing bridges at a cost of \$33,332,915.

Five designs were prepared for county bridge replacement under the Federal Highway Administration Off-System Program.

In addition to structure design, this division has been assisting in the inspection and rating of off-system or county and/or municipally owned bridges as part of the Federal Highway Administration Bridge Replacement and Rehabilitation Program.

ACTIVE PROJECTS AS OF DEC. 31, 1986

System	Awarded in 1983	Awarded in 1984	Awarded in 1985	Awarded in 1986	Total
FEDERAL-AID FUNDS					
Interstate	0	1	18	23	42
Primary	0	8	33	89	130
Supplemental	1	2	5	19	27
Off-System	3	11	45	215	274
Subtotal	4	22	101	346	473
100 PERCENT STATE FUNDS					
Interstate	0	0	0	0	0
Primary	0	4	5	7	16
Supplemental	0	0	0	2	2
Subtotal	0	4	5	9	18
TOTAL PROJECT	4	26	106	355	491

Construction

Construction work continues on Interstate Routes 44 and 270 and Route 40 in the St. Louis area, Interstate Route 229 north of St. Joseph and Interstate Routes 70, 435 and 670 in the Kansas City area. In addition to this work, construction was completed on the Heart of America Bridge over the Missouri River in Kansas City. Work continues on the Route 40 bridge crossing the Missouri River between St. Louis and St. Charles counties.

Interstate system contracts

involved new construction, upgrading existing dual facilities to Interstate standards, rest area modifications and implementing the latest safety features for highway traffic. About 17 miles were completed to Interstate standards this year. This division resurfaced 182 miles of existing Interstate pavement with asphaltic concrete this year. About 58 miles of Interstate road are now under construction.

The Off-System Bridge Repair Program, which this division administers, has increased greatly during the past year.

Primary and supplementary system contracts included new construction, bridge replacements and widening and resurfacing projects. Where applicable, the latest safety features were included. The contracts included costs of construction work in rural and urban areas and projects financed either with federal-aid or with 100 percent state funds.

Costs of inspecting construction projects were kept at a low level by upgrading equipment along with additional personnel training.

Equipment and Procurement

The Equipment and Procurement Division is responsible for procuring and maintaining a fleet of equipment that will efficiently and effectively permit the department to carry out its functions. At the end of the year, the division was maintaining 6,004 rental units consisting of passenger cars, trucks, carryalls, tractors, mowers, motorgraders and various miscellaneous units.

Fuel used in the fleet during 1986 decreased 7.9 percent from 1985. The average price of gasoline dropped 26.6 percent, while the average price of diesel

91,722 gallons of lubricating oil, 45,534 gallons of hydraulic oil and 93,290 pounds of multi-purpose gear oil and lithium grease were used. During the year, the division contracted for tires and tubes costing \$1,052,594.10, tire chains costing \$22,947.66 and shop equipment, parts and supplies totaling \$5,526,574.31.

The division is also charged with the responsibility of providing all tools, supplies and materials that are required in department operations.

The Headquarters Sign Shop produced a total of 125,239 signs and markers of various shapes and sizes amounting to \$1,004,770.26 during the year.

Use of a die cutting machine, purchased in 1983, to cut letters out of scrap reflective sheeting continues to save the department approximately \$10,000 per year.

The purchase of storage batteries, pneumatic tires and tubes for direct shipment from the supplier to each district office continued during 1986. It's estimated this operation saved more than \$25,000 in freight costs on these items during 1986.

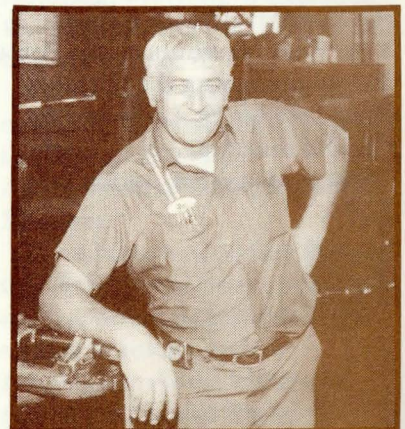
As a cost-cutting measure, other types of supplies and equipment are produced at the Headquarters Garage as time and labor permit.

1986 MAINTENANCE MATERIALS USED

MATERIAL	AMOUNT USED
Various Types of Asphalt	57,812,200 gallons
Gravel	761,278 cubic yards
Stone and Chat	1,538,320 tons
Paint	313,736 gallons
Reflectorizing Spheres	3,731,900 pounds
Sodium Chloride (Winter 1985-86)	104,108 tons
Calcium Chloride (Winter 1985-86)	4,989 tons
Agricultural Seed	52,125 pounds
Treated Wood Sign Posts	21,771 each
Steel Sign Posts	28,742 each
Grader Blades	452,225 pounds

fuel dropped 24.8 percent. The fuel monitoring program that became operational in 1984 is still being perfected. Fuel consumption problems on individual equipment units are being reviewed by various levels of supervision.

Department operations required 6,506,570 gallons of gasoline, 130,120 gallons of kerosene and 1,898,972 gallons of diesel fuel to operate the fleet. In addition 16,384 gallons of antifreeze,



Raymond C. Reinkemeyer, Headquarters Garage machinist, June 1986 Employee of the Month

Legal

During 1986, the chief counsel's office instituted various court actions for the purpose of condemning right-of-way for state highway projects involving 123 separate parcels of land. A total of 44 condemnation cases were disposed of by the entry of final judgments. Thirty-one appellate court decisions were rendered in cases involving the commission.

The chief counsel's office handled 2,114 claims for damage to commission-controlled facilities and property and received payments for such damages in the amount of \$657,687.74. This included damages collected by

litigation as well as those collected without the necessity for instituting litigation. During the year, 12 cases were filed for damage to commission-controlled property, and 33 cases of the same nature were disposed of, which included one suit for damage to a Missouri State Highway Patrol car.

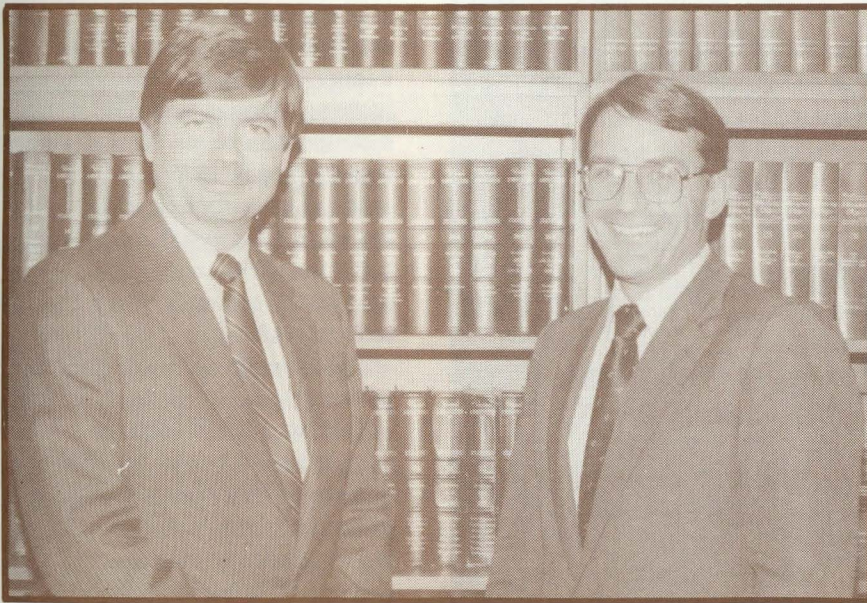
Forty-seven cases were filed against the commission for various matters, 34 of which involved tort actions. Sixty-six cases involving various matters other than condemnation and suits for damage to commission property were disposed of during 1986. Although there were 15 applications filed with the

Transportation Department for the Office of Economic Development to permit the construction or alteration of railway-highway crossings, no formal hearings were necessary because of the agreed nature of the proceedings.

Seven new cases were filed for enforcement of the Beautification Law pertaining to junkyards, and seven cases were closed, leaving 15 cases still pending in court at the end of the year. Also, during the year, there were 28 petitions filed in court in reference to the Beautification Law by which owners of billboards sought review of commission orders relating to the removal of outdoor advertising signs. In addition to the court proceedings, administrative hearings were conducted on behalf of the commission relating to outdoor advertising signs in 15 separate cases involving 29 individual signs.

The chief counsel's office also conducted one administrative hearing relating to the necessity for altering utility facilities to permit highway construction.

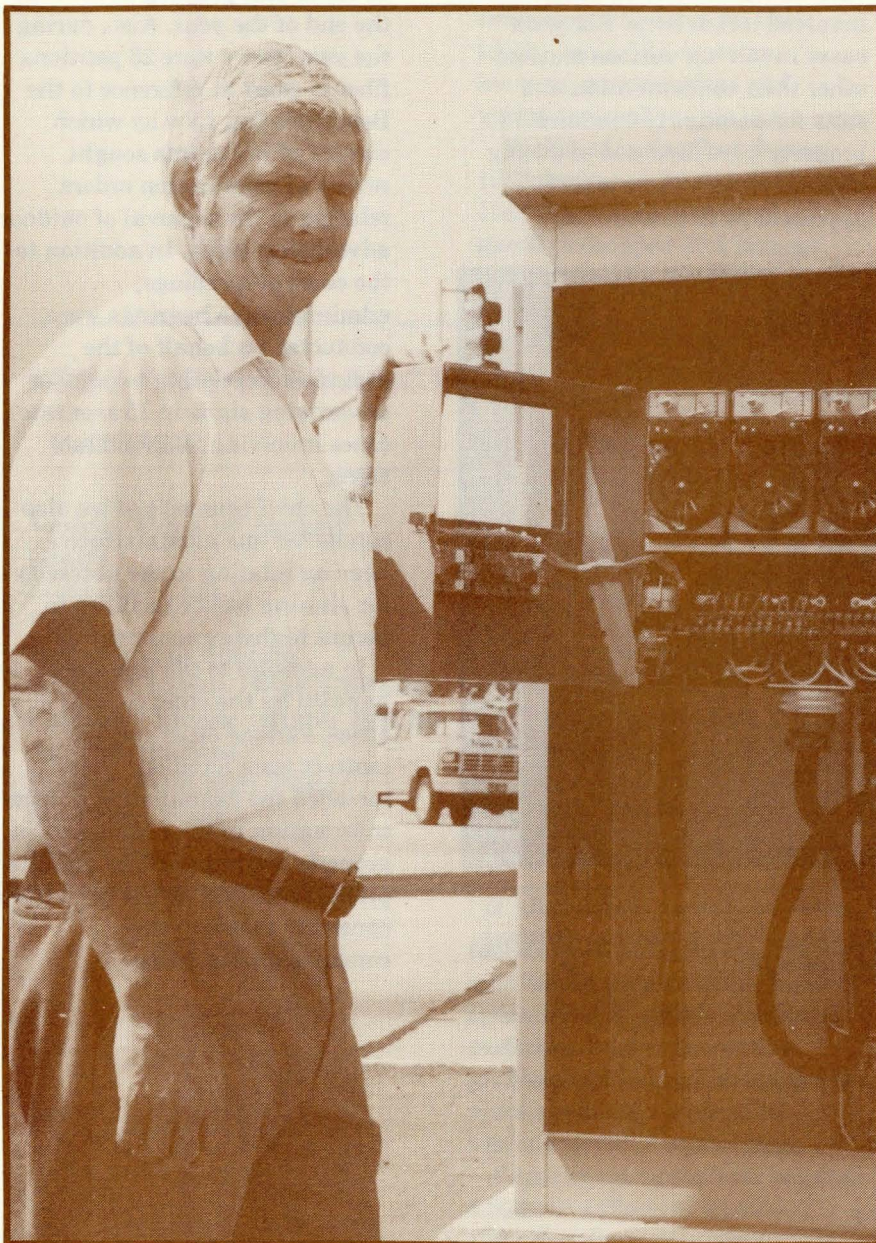
In addition to the litigation handled by the chief counsel's office, various other routine matters were handled. These included the examination of title information in the acquisition of property for right-of-way and the preparation and review of various contracts to which the commission is a party.



Chief Counsel Richard L. Tiemeyer appointed Dennis Redel (left) to assistant chief counsel-administration and John Gladden (right) to assistant chief counsel-litigation. They assumed their duties Dec. 1.

Maintenance and Traffic

In 1986, the Maintenance and Traffic Division was responsible for the maintenance of 34,019 center-line miles. This mileage included recreational access roads, outer roadways, ramps, service roads and maintenance agreement sections.



Wallace B. Campbell, district traffic studies engineer-District 5, September 1986 Employee of the Month

One of the major expenditures of the division is the cost to maintain low-type bituminous surface routes. In 1986, 3,240 miles of this roadway were surfaced under the division's maintenance leveling course program. In addition, the division completed 1,061 miles of contract leveling course and 220 miles of contract seal coat.

In 1986, the division used about 49,674,000 gallons of asphalt and 1,447,620 cubic yards of aggregate in bituminous surface and patching operations. The division used 34,418,700 gallons of emulsified asphalt and 15,255,300 gallons of cutback asphalt. Sixty-nine percent of the asphalt used was emulsified asphalt.

The department, in a continuing effort to conserve energy, has been building pool parking areas in and adjacent to metropolitan areas. This program was started in 1975 with the original construction of 717 spaces. At the end of December 1986, the division had 80 operative parking areas with a total of 4,489 spaces available.

The average daily usage of the parking areas in the last quarter of 1986 was 2,580 vehicles compared to 2,514 in the last quarter of 1985. In 1975 when the program began, average usage of the available spaces was 42 percent. This had increased to 57 percent in the last quarter of 1986.

In terms of dollars spent, the winter of 1985-86 was milder than the previous winter. The division spent a total of \$17,447,500 on snow and ice removal operations during the 1985-86 winter season, a decrease of 22 percent from the previous season.

In 1986, the division installed 20 liquid calcium chloride dispensing units in the major urban areas of the state. This liquid is applied to salt and other abrasives and will provide a more

efficient means of removing snow and ice from the roadway.

In fiscal year 1986, the division mowed approximately 431,600 acres of right-of-way at a cost of \$10,943,286. The average cost per acre was \$25.35. In addition to this mowing expenditure, \$2,411,071 was spent picking up litter.

Division personnel made routine inspections on all state maintained span-type bridges to determine their condition and need of repairs. In 1986, 6,573 bridges on the state highway system were inspected. Thirty-seven of these are Missouri or Mississippi River crossings, 19 of which are jointly maintained by adjacent states.

Division repair crews completed structural repairs on 138 bridges. In addition, 13 other structures were repaired because of collision damage.

Division bridge crews painted 129 bridges during the year. Of this total, 81 bridges received a

Phase I of the traffic records system upgrade was completed during the year. This activity was funded from 402 Program funds under the 3+ Standards of the Missouri Highway Safety Program.

complete painting, while 48 bridges were partially painted. The crews applied 6,155 gallons of paint.

The division is maintaining 20 rest areas on the Interstate system. Four include tourist information centers. In addition, there is also a tourist information center located in Hannibal on Route 61.

It is the division's goal to keep roadsides free of erosion and to make them attractive to the



George Gardner, District 4 maintenance crew leader

motorist. To accomplish this, it is necessary to establish a healthy turf that resists the invasion of unwanted vegetation. In 1986, the division purchased approximately 41,300 pounds of seed to use for revegetating right-of-way. This quantity includes about 7,000 pounds of crown vetch.

Weed infested right-of-way is unattractive to motorists and undesirable to adjacent landowners. In an effort to control unwanted vegetation, approximately 3,800 acres were treated with herbicides by contract in 1986, and enough herbicides were purchased for use by maintenance forces to treat about 16,500 additional acres. The department is required by law to control Musk, Scotch and Canada Thistle in all counties. In some counties, the division is also required to control Johnsongrass.

There were 87,086 overdimension, overweight and overdimension/overweight special permits issued during 1986. Of this total, 22,196 or 25 percent were issued by the district offices. Included in the total were 1,400 permits issued to governmental agencies or subdivisions with fees.

In 1986, one intersection on the

state highway system was signalized by maintenance forces. Modernization of existing traffic signals continued throughout the state.

Maintenance forces upgraded or installed new traffic control equipment at 34 existing signalized intersections. The program to interconnect various traffic signals for traffic progression was continued. New equipment to control traffic signals more economically was placed in service for evaluation.

Contracts were also let to replace a number of two-way mobile radios and fixed station equipment and remote control consoles in two of the districts.

The ongoing program of systematic monitoring of peak period freeway traffic operations in the St. Louis and Kansas City areas was continued in 1986. This surveillance program provides information on the location and severity of traffic congestion on this 170-mile urban freeway system.

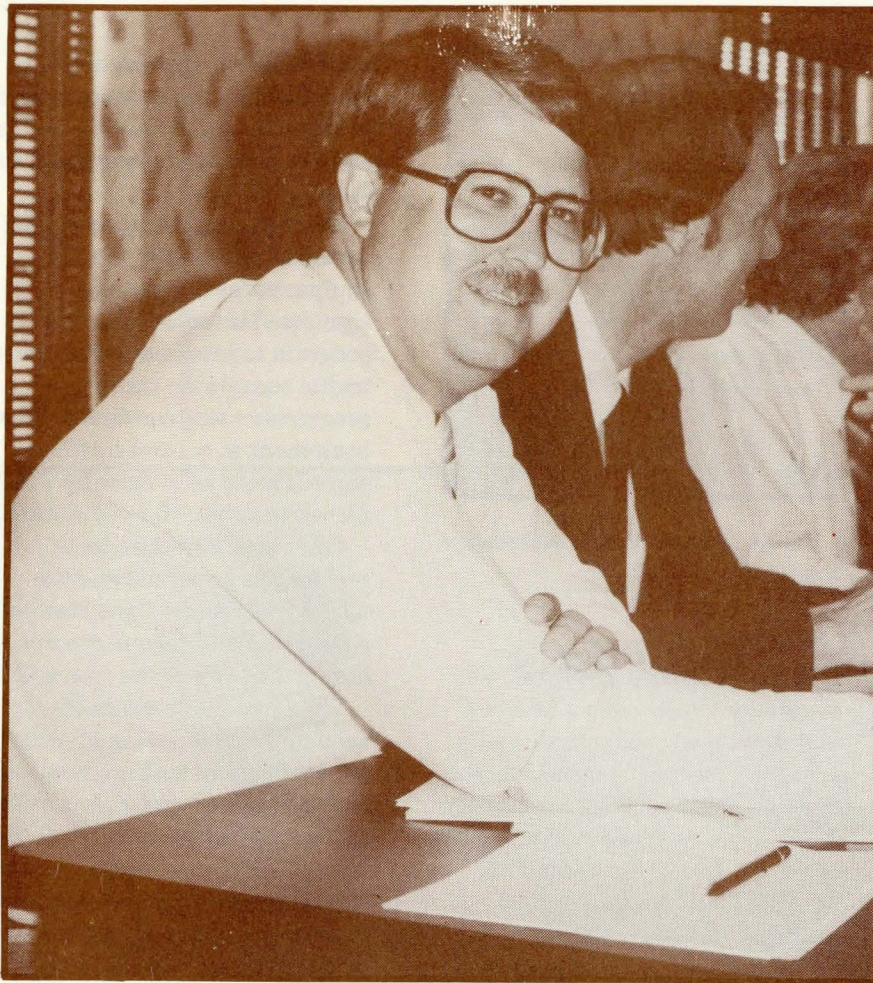
Additional surveillance and limited analysis were made at specific problem locations. These included Interstate 70 in St. Charles and St. Louis counties from Route 94 to Interstate 270. Other spot locations were the subject of more limited studies.

During the construction season, much of the freeway system was impacted by the construction activity.

During 1986, 58,691 accidents that occurred on the state highway system were coded and placed in the accident data records system. These reports were provided by the Missouri State Highway Patrol and approximately 565 city and county enforcement agencies.

Speed studies were conducted at 130 locations, and traffic volume

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Phil Broyles, District 8 Maintenance and Traffic Engineer

counts were made at 229 locations.

The division continued its 120/Medium Improvement Program in 1986. Eleven locations where a higher than normal number of accidents had been occurring were investigated. At five of these locations, corrective measures have been implemented.

The division also investigated 100 locations that had 20 or more accidents in the three-year period, and countermeasures were evaluated for possible funding under Section 209 of the 1973 Federal Highway Act. Forty-two of these locations have been tentatively programmed for improvements on the Right-of-Way and Construction Program at a total estimated cost of \$4,747,677.

State forces removed 12 billboards, and property owners removed 332 billboards under the outdoor advertising laws and regulations. There were 722 new permits issued for billboards and 6,013 permits renewed under these regulations. The division also issued 223 licenses for junkyards and 11,540 driveway and excavation permits in 1986.

Activities funded from 402 Program funds under the 3+ Standards of the Missouri Highway Safety Program and coordinated by the Missouri Highway and Transportation Department are as follows:
—The Traffic Engineering Assistance Program: This is a program to aid the political subdivisions with traffic engineering problems where comprehensive review is required and where the subdivision does not have the personnel available to carry out the review. These services are performed by two consultants retained by the commission for this purpose. Twenty-two studies were conducted in 17 political subdivisions in 1986. The average cost of these studies was \$2,665 per study.

—The Bridge Engineering Assistance Program: This is a program established to aid political subdivisions in obtaining information on the structural adequacy of bridges under their jurisdiction. These services are performed by two consultants retained by the commission on a yearly contract. The service includes determination of structural adequacy, establishment of posted weight limits and development of priorities for the repair or replacement of bridges. Structural adequacy reports and inventories were conducted on 49 bridges during the year at an average cost of \$1,658 per bridge.

—The 37th Annual Traffic Conference was held April 28-30, 1986, at the University of Missouri-Columbia campus. About 115 participants from various counties, cities and state and federal governments attended this two-day conference that dealt with solutions to traffic problems. —A series of Highway Capacity Manual Workshops were held during the year. These workshops were developed to acquaint traffic engineers with the contents of the 1985 Highway Capacity Manual. —Phase I of the traffic records system upgrade was completed during the year. This project is designed to facilitate efficient analysis of accident reports by the division. Phase I consisted of performing a feasibility study, procuring equipment and hiring a consultant to perform various computing tasks.

The sign reclamation plant, which began operation in September 1977, provided 99,270 metal and 120 wood signs or 79 percent of the sign blanks used in 1986. In addition to providing sign blanks, other component parts of sign hardware such as z-bars, button copy, button reflectors, locking tabs and backing strips were also salvaged by the reclamation plant. The total savings to the department by the reclamation plant during 1986 was approximately \$300,100. Since the plant went into operation, it has saved the department about \$2,285,100.

During 1986, the department placed a total of 61,700 miles of center-line, lane-line and edge-line stripes. This total included 38,800 miles of center-line and lane-line stripes and 22,900 miles of edge-line stripes. In conjunction with this striping, approximately 18,100 miles of no-passing zone stripes were also placed.

Materials and Research

The quality of materials intended for use in the construction and maintenance of the state highway system is the primary responsibility of the Materials and Research Division. This responsibility is carried out in many ways, including the preparation of material specifications, exploratory subsurface soundings, pavement type selection, soil and condition surveys, quality control of aggregates, design and control of Portland cement and asphaltic concrete mixtures, special

investigations and research. Testing and evaluation of all materials used in constructing and maintaining highways and bridges are carried out at the headquarters in Jefferson City, in the 10 districts and in the field.

The central laboratory in Jefferson City is an approved facility. The American Association of State Highway and Transportation Officials (AASHTO) Materials Reference Laboratory, National Bureau of Standards, inspected the laboratory in 1986, and no deficiencies were found in equipment or procedures.

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1986 COMMONLY USED MATERIALS INSPECTED, TESTED AND APPROVED

MATERIAL	AMOUNT	
Aggregates	8,940,859	tons
Cement	469,559	tons
Reinforcing Steel	22,778	tons
Culvert Pipe		
Corrugated Metal	99,801	linear feet
Reinforced Concrete	115,835	linear feet
Vitrified Clay	2,348	linear feet
Joints - Bituminous, Fiber	201,185	linear feet
Joints - Rubber	24,002	square feet
Joints - Metal	129,270	linear feet
Guardrail	197,754	linear feet
Posts, Metal	89,908	posts
Precast Units		
Median Barriers	5,079	units
Concrete Bridge Beams	1,601	units
Concrete Inlets	864	units
Concrete Manholes	221	units
Lumber and Square Posts	470,183	board feet
Piling and Round Posts	2,000	linear feet
Bituminous Material		
Cutback	14,885,576	gallons
Penetration	11,713,732	gallons
Emulsified	36,567,273	gallons
Asphalt Cement	29,761,648	gallons
Paint	601,364	gallons

Many of the materials that are routinely tested in the field are also tested in the laboratory. This is done in order to insure uniformity of testing procedures on a statewide basis. The laboratory also tests all materials requiring specialized equipment or procedures. In 1986, laboratory personnel tested 16,939 samples, including those of an experimental or investigative nature.

During the year, the division was actively engaged in 11 major

During 1986, the division's research capabilities were enhanced by the purchase of automatic rapid freezing and thawing equipment that . . . will greatly reduce the time required for long-term testing of materials.

research projects. In most cases both laboratory and field investigations were required. Items of investigation ranged from materials and methods used to lengthen the life of bridge decks to research into the properties of aggregates used in Portland cement concrete. Among the other investigations performed were the evaluation of approximately 94 new products proposed for use, as well as a large number of various small investigations such as pavement condition and erosion control methods.

During 1986, the division's research capabilities were enhanced by the purchase of automatic rapid freezing and thawing equipment that, when fully operational in 1987, will greatly reduce the time required for long-term testing of materials. In some cases, a reduction in time for testing from two years to two months will be realized.

With the advent of the Strategic Highway Research Program sponsored by AASHTO, this division was assigned the responsibility of state coordinator for the program. The division evaluated and submitted 69 candidate sites for the long-term pavement performance studies portion of the program with 65 sites being approved.

As in the past, the division has been given responsibility for a large number of bridge deck condition surveys. These surveys are required to determine the amount of rehabilitation necessary such as patching, waterproofing and, in some cases, the addition of new wearing surfaces or complete deck replacement. In 1986, 141 bridge deck condition surveys were performed.

The division has the responsibility for obtaining and interpreting the subsurface information required to effectively design highways and bridges. The basic data is obtained by drilling equipment and crews based in the division headquarters in Jefferson City. Crews and equipment are dispatched as needed to all parts of the state. Bridge foundation investigations were performed for 91 structures, including an investigation of the Route 115 Missouri River crossing, St. Charles, that required a barge, tug and support services.

Division personnel are also available to conduct special investigations, analyze materials and make recommendations on the various geotechnical matters such as foundation stability and settlement, slide corrections, soil and material surveys and retaining structures.

Personnel

The Personnel Division provides staff assistance to the department regarding personnel management matters such as employment, college recruiting, employee training and development, wage and salary administration, personnel policy administration, affirmative action administration, employee relations and maintenance of personnel management records and statistics.

The division assists in developing and implementing administrative programs to ensure that competent applicants are attracted to jobs with the department, that employees are properly trained in their occupation and that working conditions are conducive to both high productivity and fairness toward employees.

The department is an equal opportunity employer and considers affirmative action a high priority. The Personnel Division, along with the districts, has concentrated efforts to attract

qualified minority and female applicants. The division monitors Equal Employment Opportunity (EEO) progress and keeps the headquarters office and districts informed.

The orientation and training of new employees is primarily conducted through the department's supervisors. New employees are provided with several publications to familiarize them with the department's functions, working rules and regulations and employee benefits.

Employees, in obtaining the fundamental knowledge of their job, may become eligible for attendance at training conferences and seminars related to their specific work assignments. Most technical skills training is provided by operational divisions, using staff with the necessary expertise. The division supplements this employee training by periodically conducting supervisory training programs tailored specifically to the policies and needs of the department.

The department continues to

develop its human resources, minimize costly employee turnover and maintain a work environment conducive to high employee morale and motivation. All personnel transactions are reviewed by the division to attain equitable and uniform salary administration and policy application. Job evaluations are conducted to maintain accurate job specifications and internal salary equity.

To maintain an adequate salary structure and employee-benefits program within budgetary limitations, periodic compensation surveys are conducted. During the year, a review of records for prior state service that may be creditable toward retirement continued.

The division maintains daily liaison with headquarters and district administrative personnel to assist in clarifying personnel administration matters.

The division processed 108 claims for unemployment compensation during 1986 and obtained 73 denials of unwarranted compensation, thereby avoiding considerable expense to the department.

Centralized personnel records are kept with considerable personnel data being used for statistical analysis of employee profiles, employee trends, manpower planning, etc. Personnel records have been improved through computer applications, which permit a more rapid recovery of personnel data required for government and operating reports.

The Department had 6,148 salaried employees on Dec. 31, 1986, in addition to 578 summer employees during the summer of 1986. Temporary and emergency employees are also employed as



Russell Keith, director of employee relations, presented personnel information to employees who attended the Equipment and Procurement Division's annual fall meeting.

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needed for short durations such as for snow removal.

The division held several pre-retirement seminars for headquarters employees, and their spouses, who met retirement eligibility requirements.

During 1986, 148 employees were processed for retirement. Thirty-one were between ages 55-60 with 15 or more years of service; 80 were between ages

As of Dec. 31, 1986, the average employee had given 16 years of service to the department.

60-65 with 15 or more years of service; 21 were between ages 65-70 with four or more years of service; and 16 had become incapacitated and qualified for disability benefits. Nine vested members also elected to begin annuity benefits. The Highway Employees' and Highway Patrol Retirement System is currently paying benefits to 2,280 department retirees and survivors.

The department recognizes that skilled work results, high productivity and sound decision-making are products of retaining a trained, experienced work force. As of Dec. 31, 1986, the average employee had given 16 years of service to the department.

As part of its overall Affirmative Action Program, the department is committed, under Title VI, to encourage, develop and implement programs assuring that disadvantaged and women-owned business enterprises are afforded every opportunity to participate in state and federally-assisted programs as contractors, consultants and suppliers.

The department has reduced selected contract sizes to provide

more entry opportunities for smaller, less-experienced disadvantaged and women-owned firms. The department has also permitted joint ventures by disadvantaged and women-owned firms in order to provide more entry opportunities.

An updated list of Missouri and surrounding-area disadvantaged and women-owned businesses has been distributed. It is categorized by area of experience, location and specific product or services, and is sent to all contractors qualified to bid on work and to political subdivisions having initiated federal aid-urban projects. The contractors and political subdivisions are encouraged to use the disadvantaged and women-owned firms when possible.

Bidders on construction projects in Missouri are required to certify whether they intend to subcontract a portion of the work. If so, the bidders are obligated to take affirmative action in attempting to use disadvantaged and women-owned firms on the intended subcontracted portions.

Through the department's affirmative action efforts, \$26,879,796 in state and federally-assisted contracts and subcontracts were awarded to disadvantaged and women-owned firms during 1986.

Planning

Planning for the state's future highway system was an important part of the Planning Division's efforts in 1986. This involved collecting and maintaining financial and roadway information, determining both existing and future highway needs and developing planned highway improvements and financial programs to meet those needs.

The division was actively engaged in developing a 15-year needs study. This report, including supplementary finance data, roadway and bridge deficiencies and map and charts, was prepared for general use in determining Missouri's future needs.

The 1986 Bridge Service Rating and the 1986 Interstate and Primary Service Ratings were prepared. Data used in the annual update of the National Highway Performance Monitoring System was collected, and a report was prepared summarizing the information. The low water crossing report was updated to record the latest flooding information. A benefit-cost analysis was made on select locations proposed for highway improvement.

The 1987 Interstate Cost Estimate was prepared and submitted to the Federal Highway Administration. The division also published the Highway Right-of-Way and Construction Program showing the proposed improvements for 1987.

About 4,000 vehicle counts and 150 manual classification counts were made on the 32,000 miles of state highways in 1986. Speed surveys were conducted at 34 statistically selected locations throughout the state to determine average operating speeds. Vehicle miles of travel on the state

highway system increased nearly 5.6 percent from 1985, establishing a new travel record for Missourians.

The annual vehicle travel and accident report was prepared for 1985. The report includes information on travel, accidents and accident rates for all roads and streets in Missouri.

Truck classification and vehicle weight information was gathered at all weigh stations in 1986. Information on vehicle dimensions, commodities transported and travel was also gathered.

Selected travel characteristics were gathered at nine locations within the state by conducting roadside interviews with motorists. The information from these studies was used to determine needs and plan improvements for the locations.

The comprehensive planning

program continued in the six urbanized areas of more than 50,000 population. This process requires the cooperation of local planning organizations and the department. The program continued through 1986 in the urbanized areas of St. Louis, Kansas City, Springfield, St. Joseph, Joplin and Columbia.

Cities of more than 5,000 population received assistance in updating their functional classification and federal-aid systems. Information was compiled to update the National Highway Performance Monitoring System in urban areas. About one-half of the information was developed from characteristics of the six urbanized areas.

This division received 21 requests for changes in route

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STATUS OF MISSOURI HIGHWAY SYSTEM

(As of Dec. 31, 1986)

SYSTEM	ROAD MILES
Interstate	1,156.609
Primary	6,836.824
Supplementary	24,278.703
TOTAL	32,272.136

TYPE	ROAD MILES
Granular	1.184
Low-Type Bituminous	24,783.516
High-Type Bituminous	4,792.623
Concrete	2,694.813
TOTAL	32,272.136



Phil Jackson became assistant Planning Division engineer February 1.

status in 1986. Fifteen of these requests were processed and completed during the year.

Twenty-six county highway maps were either revised or redrawn this past year. There were also 417 city maps and 15 urban-vicinity updated. Work continued on the new state highway map to be published in 1987.

The division continued to compile financial and statistical data related to the highway system. This information is used in monitoring the department's cash flow, updating and maintaining route history records and developing financial programs relating the funding needs.

Public Information

The Public Information Division is responsible for keeping employees and the general public informed about the various activities of the department.

The highlight of the division's activities for 1986 was hosting the workshop of the National Public Affairs Subcommittee of the American Association of State Highway and Transportation Officials (AASHTO). Staff members spent long hours developing the workshop's program and planning the convention details. Efforts were successful as public affairs representatives from 42 states visited the Lake of the Ozarks Aug. 5-7 to learn new tricks of the trade and exchange ideas and information.

Throughout the year, the division prepared and distributed 122 news releases to the media in an effort to keep the public informed about department activities. The statewide newspaper clipping service continued, keeping officials informed of department coverage and comment.

One of the employee communication tools the division uses is the **Highway and Transportation NEWS**. This publication was printed and distributed monthly to more than 9,000 people, including employees, retirees and other interested persons.

Division personnel also presented a public relations/communications seminar to help district employees in supervisory positions increase their communication skills. A similar program was also presented to district clerical staff who work with the public.

The division answered about 200 mail and telephone requests per month regarding maps, road information, routings and educational material.

A variety of speeches and brochures, along with the department's annual report, were developed by division personnel to help tell the department story.

Personnel supervised the distribution of one million highway maps, many of which were distributed at the Missouri State Fair. Personnel staffed the annual fair exhibit in the Highway Gardens, a roadside park on the fairgrounds. The gardens and exhibit building were refurbished during the year, and new exhibits featuring archaeology and photogrammetry were viewed by the more than 300,000 people who came through the park during the fair's 10-day run in August.

Keeping track of legislation of department interest kept staffers busy during the months when the General Assembly was in session.

Division personnel assisted in many dedication and opening



Public Information Director Art Taylor (right) presents G.M. "Dude" Threlkeld with a plaque honoring him as a co-founder of the AASHTO Subcommittee on Public Affairs while serving as the department's Public Information director from 1946 until his retirement in 1970.

ceremonies for various projects during the summer and early fall months.

The division also coordinated the Employee of the Month program. One Department employee was chosen each month based on his or her job

performance, general attitude, community involvement and distinguished service to the department and to the motoring public.

The department's technical and video library also continued to be housed in the division.

Right-of-Way

During 1986, the cost of right-of-way acquired for highway construction totaled \$12,654,934.

The division acquired 802 parcels, 743 by negotiated settlement and 59 by condemnation, or 93 percent by negotiation and 7 percent by condemnation.

Payments totaling \$1,147,420.62 were made in 1986 under the

Relocation Assistance and Payment Program to assist displaced families, businesses and farm operations in relocating. During the year, 346 relocation claims were processed and paid.

The division obtained appraisals for 816 parcels during 1986. Two separate appraisals were prepared for 6 percent of the parcels involved, making a total of 865 appraisals produced. An average of 68 parcels was

appraised each month, which required an average production of 72 separate appraisals per month.

Receipts from the sale of improvements located on right-of-way acquired for highway construction and from the sale of excess property totaled \$922,697.21.

Rental of airspace, excess property and property acquired for future construction resulted in an income of \$324,191.77.

Surveys and Plans

The Surveys and Plans Division is responsible for preparation of roadway improvement studies, plan preparation and the letting of contracts.

Meetings and formal hearings are held as needed or required to explain the need and purpose of highway improvements and to obtain public input. Coordination is also required with local, state and federal agencies. During the past year, tentative location approval was obtained on 36 highway improvements with 16 formal location and design public hearings and several public meetings held.

Photogrammetric surveys using aerial photography are initiated during early project development. Field surveys supplement this work and provide the basic information for plan development.

Assessment of environmental impacts for each project are considered. This includes air quality evaluation, noise studies and cultural, social and economic considerations. Cultural resource survey reports were completed on 81 projects; however more than 250 were reviewed and cleared in-house.

Prior to letting highway improvements, right-of-way is acquired, arrangements are made for necessary utility adjustments and necessary permits and licenses are obtained from state and federal agencies. Approval of detail plans for right-of-way acquisition was obtained on 90 projects in 1986.

The Disadvantaged and Women Business Enterprise Program provides an opportunity for businesses owned and controlled by socially and economically

disadvantaged individuals or women to participate in the performance of contracts or subcontracts financed in whole or part with federal funds. The amount of participation by these firms during the year was \$20,380,921 for Disadvantaged Business Enterprises and \$4,815,732 for Women Business Enterprises.

Projects with Interstate discretionary and bridge discretionary funds totaling \$13,739,435 were realized in 1986. Discretionary bridge funds are made available for larger bridges. Interstate discretionary funds are an extraordinary allotment of Interstate funds that are provided as a bonus to states who have obligated their normal Interstate apportionment and are in a position to use these funds within a 90-day period after obligation. Interstate discretionary funds permit the department to accelerate completion of the

Reduced federal funds caused cancellation of two highway lettings; thus only nine highway lettings were held in 1986.

Interstate system of highways. Bridge discretionary funds facilitate replacement of major structures without using normal federal-aid apportionments.

The division also administers several federal-aid programs that provide funding for cities, counties and rail-highway crossing safety improvements.

The Federal-Aid Urban (FAU) Program provides federal funding for street and highway construction in cities and urban areas with more than 5,000 population. During 1986, approximately \$11,092,000 was obligated in cities throughout the

PROJECTS AWARDED FOR 1986

1986 REPORT	AWARDS	MILES	PROJECTS
Interstate System	\$ 86,695,179.97*	84.068	46
Primary System	86,514,579.98	215.470	84
Supplementary System	37,528,962.97	139.102	75
Maintenance Work	23,130,066.45	1,281.017	199
Off-System (County Bridges)	1,951,155.49	1.216	5
Federal-Aid Urban (on State System)	8,599,100.96	15.464	9
TOTALS	\$ 244,419,045.82	1,736.337	418

*Includes Missouri share of Jefferson Barracks Bridge let by Illinois Department of Transportation.

state for this program. The FAU funds are generally used to finance 75 percent of the cost of eligible projects with local jurisdictions providing the 25 percent matching funds. During the year, 24 projects were approved for construction under this program.

The FAU Bridge Replacement Program financed eight large bridge replacement projects in urban areas in 1986 at a cost of approximately \$7,872,000. Bridge replacement funds are used to finance 80 percent of the cost with local agencies responsible for the remaining 20 percent.

The Off-System Bridge Rehabilitation and Replacement Program provides federal funds for bridge repair and replacement on county roads not on a federal-aid system. During 1986, approximately \$17,960,000 was

obligated for projects qualifying for this program with counties providing 20 percent matching funds. During 1986, 52 projects were approved for preliminary engineering charges, 22 were approved for construction and 90 projects were placed under contract by the counties.

Safety improvements at railroad-highway crossings are available through the Rail-Highway Safety Program Section 203 Funds. During 1986, 42 crossings were improved by the installation or replacement of standard or cantilevered signals and/or gates. Five of these crossings were on the state highway system, and the remaining 37 were on city streets or county road crossings. The cost of the work was \$3,360,000 of which 88 percent was spent on the 37 off-system crossings.

The project to install 12-inch roundels is 99.5 percent complete, with only 12 crossings remaining with 8-inch roundels.

The program to improve the riding quality of railroad-highway crossings at 135 locations was completed in 1986. Five high-type crossings were completed. A total of \$220,000 was spent on this program.

Reduced federal funds caused cancellation of two highway lettings; thus only nine highway lettings were held in 1986. Projects totaling \$244,419,045.82 were placed under contract. An average of 4.5 bids was received per project.

Prices decreased during 1986 with the Missouri average composite cost index being 187.0 compared to base year 1977. The 1986 cost index reflects a 0.5 percent decrease when compared with the 1985 cost index of 188.0.

Transportation



Aviation

Aviation, as an industry, is a major contributor to the economy of the state. As a mode of transportation, it is essential to the movement of millions of Missouri residents each year. The Aviation Unit actively promotes these values through the development of the industry, the improvement of airports and the education of local governments and individuals.

Personnel of the Aviation Unit are available for information or technical advice to airport sponsors and any others who are interested in the establishment, improvement or promotion of aeronautical facilities.

Aviation provides financial assistance to cities, towns or counties throughout the state through two grant programs. The Capital Improvement Grant Program provides financial assistance to sponsors of publicly owned airports for planning, construction or expansion. Funds under this program are granted on a 50 percent state/50 percent local matching basis.

Under the airport maintenance program, funds may be granted to airport sponsors on a 75 percent state/25 percent local basis for maintenance on runways, taxiways, parking aprons and for emergency repairs. The financing of this program is derived from the unrefunded portion of the motor fuel tax that is applied to aviation gasoline.

A portion of the unrefunded fuel tax is used for the annual publishing and distribution of the Missouri Aeronautical Chart and Airport Directory. Aviation published 7,100 copies of the Missouri Aeronautical Chart and Airport Directory at a cost of \$13,135.

As a result of the Airline Deregulation Act of 1978, the

aviation unit is active in monitoring the small community Essential Air Service Program that is regulated by the Department of Transportation. A requirement of the act is that all actions affecting the air service to smaller communities must be coordinated with state aviation agencies.

Under a contractual agreement with the Federal Aviation Administration (FAA), the aviation unit inspects general aviation airports, both publicly and privately owned, that are open to the public. During 1986, there were 174 airports inspected,

Missouri has a total of 431 airport facilities. These include 355 airports, 71 heliports and five seaplane bases.

102 of them under the FAA Airport Master Record (5010) Program, and 157 obstruction evaluations performed with two objections filed.

Missouri has a total of 431 airport facilities. These include 355 airports, 71 heliports and five seaplane bases. Of these, 152 facilities are open to the public and 279 are restricted use. There are 5,250 active general aviation aircraft and 13,115 active pilots in the state. Ten airports provide scheduled air transportation and enplaned about 15 million passengers in 1986.

During the year, 41 applications for financial assistance under the airport capital improvement and maintenance programs were received and processed. Aviation provided 21 capital improvement grants for a total of \$351,804 and nine maintenance grants totaling \$110,787. The \$351,804 in capital improvement grants generated an additional \$5,829,648 in combined local and federal money.

Third State Economic Development projects were in progress at 19 Missouri airports during 1986. Funds authorized for these projects total \$967,495.32.

The system analysis section update of the Missouri State Airport System Plan was approved by the FAA during 1986. The system development section update is ongoing, and a computerized update of the complete plan began in 1986.

In cooperation with the Federal Aviation Administration, the East-West Gateway Coordinating Council and the Illinois Department of Transportation's aviation division, the aviation unit is participating in an economic impact study to determine the contribution of aviation activity to the economy of the Metropolitan St. Louis Region. In a separate effort, the same parties are engaged in a helicopter/heliport system plan to measure the current and future helicopter activity in the region and the feasibility of establishing a network of heliports to serve the area.

The aviation unit is participating in a task force with the FAA, the airlines and St. Louis-Lambert International Airport management to study various methods to increase the capacity of the airport and to reduce delays that are developing as a result of increasing airline traffic.

Railroads

The purpose of the railroad unit is to provide, maintain or improve rail transportation within Missouri. Railroads administers the following programs: rail planning, rail project implementation and the Amtrak 403(b) program.

In 1986, the rail planning activities program concerned itself with several different items including the following: the collection and tabulation of railroad data to be included in the next scheduled **Rail Plan**

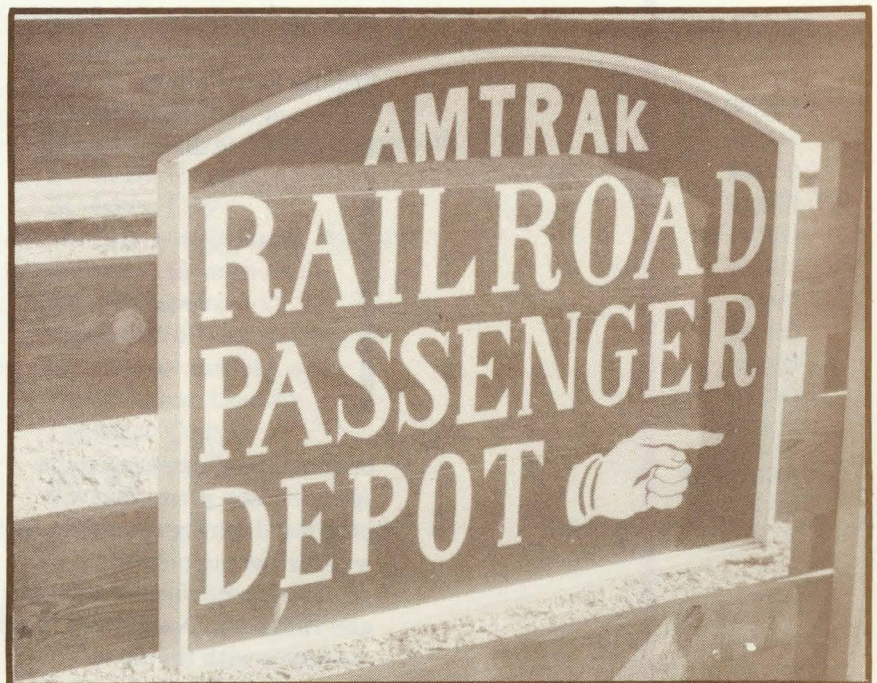
Update; the analysis of specific light density lines as possible candidates for rail projects; branch line abandonments; the monitoring and implementation of federal rail legislation; the Santa Fe/Southern Pacific merger; the Conrail disposition; the Union Pacific/Missouri-Kansas-Texas railroad merger; the execution of the Missouri and Western Railway Company's acquisition of the Illinois Central Gulf Railroad Line between St. Louis and Kansas City; and other general railroad matters.

The rail project implementation program involved both the submission of project applications to the Federal Railroad Administration and the commencement of two rail projects. Their status is as follows:

Project Applications

- 1) Scott City Port Access Rail Facility Construction Project (1.6 miles): This application is pending approval.
- 2) Missouri-Kansas-Texas Railroad Rail Renewal Project from LaDue to Montrose (8.3 miles): This application was approved using FY 1986 discretionary funds. The project is estimated to cost \$1,231,000; the federal share is \$400,000 with the railroad share being \$831,000. The grant agreement has been executed, and work should begin in the summer of 1987.
- 3) Columbia to Centralia Rehabilitation Project (21.7 miles): This application is pending approval.
- 4) Chillicothe to Kelly Rehabilitation Project (37.6 miles): This application was

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approved for additional federal monies.

Rail Projects

1) Chillicothe to Kelly (37.6 miles): Rehabilitation work began in October and is anticipated to be completed in the spring of 1987. Project monies included federal funds of \$324,480, Third State Building Funds of \$300,000 and community development block grant funds of \$173,250, for a total of \$797,730.

2) Montrose to Appleton City (3.74 miles—Missouri-Kansas-Texas Railroad): Rail renewal began in November and was completed except for welding joints. The project is estimated to cost \$501,000 with the federal share being \$290,000 and the railroad share being \$211,000.

Missouri provides rail passenger service between St. Louis and Kansas City through participation in the Amtrak 403(b) program. Both the "Ann Rutledge" and the "St. Louis/Kansas City Mules" are funded by a ratio of 65 percent state funding/35 percent Amtrak funding. During 1986, these two trains carried 155,778 passengers.

Several station improvement projects were funded including roof and interior repairs at Sedalia and platform work at Kirkwood, Jefferson City and Independence. In an effort to

Missouri provides rail passenger service between St. Louis and Kansas City through participation in the Amtrak 403(b) program.

build public awareness, route-specific radio promotion was purchased during the spring and was further supplemented by advertisements for the state fair and Hermann Oktoberfest. Work continues with the city of Hermann in its efforts to make

track-side improvements that would benefit Amtrak passengers who visit the community.

Other rail passenger activities included ongoing discussions with Amtrak personnel regarding improved equipment maintenance and on-time performance, and continuing work on the high-speed rail study grant awarded during 1985 by the Federal Railroad Administration. This study will explore ways to improve rail passenger service between St. Louis and Kansas City.

Transit

The transit section assists in the planning, development and operations of public transit systems and specialized paratransit systems in the state. This function is carried out through administration of state and federal programs relating to general public transportation and specific programs for the elderly and handicapped.

The Missouri Elderly and Handicapped Transportation Assistance Program provides state financial assistance for non-profit organizations offering transportation services to the elderly and handicapped at below cost rates. In 1986, \$579,521 in state general funds were matched with approximately \$2 million in federal funds to subsidize elderly transportation services.

In addition, \$450,000 in state general funds were matched by \$450,000 in county, city or other local funds to provide essential services for other transportation disadvantaged, especially employees of sheltered workshops. Total transportation funding generated by this program was approximately \$3,529,000. More than 2,490,000 special transit trips were

produced through this program.

Transit also administers funds made available by the U.S. Urban Mass Transportation Act (UMTA) of 1964, as amended. Under Section 18, money is available for planning, capital and operating assistance for public transit systems in non-urbanized Missouri areas. There are now 32 operating transit projects in non-urbanized areas of Missouri.

During 1986, \$2,502,866 in federal funds was approved for local capital and operating projects. Federal funds may be used to match local funds for capital purposes on an 80 percent federal/20 percent local basis. Federal funds also may be used to

defray 50 percent of a transit system's operating losses. Passenger trips provided in 1986 were more than 2,300,000 compared to 2,180,000 in 1985.

Section 9 of the UMTA provides federal formula capital and operating assistance to transit systems in urbanized areas (more than 50,000 in population). The department administers this program for Columbia, Springfield, St. Joseph and Joplin. In 1986, the department approved \$2,415,186 in federal aid to the transit systems in Columbia, Springfield and St. Joseph.

Capital assistance to non-profit organizations giving

transportation service to the elderly and handicapped is provided by Section 16(b)(2) of the UMTA. In 1986, the program provided \$612,498 in federal assistance. This was matched with \$153,125 in local funds for the purchase of 38 vehicles, wheelchair lifts, ramps and similar equipment for 19 elderly and handicapped organizations.

The transit unit provided staff support for the statutory Coordinating Council on Special Transportation. This council investigated problems in the delivery of special transportation services in Missouri and recommended solutions to the governor and General Assembly.

Waterways

Waterways provides technical assistance to Missouri port authorities in promoting private capital investment, in increasing the volume of commerce and in the establishment of a free trade zone within their port districts. Every city or county situated upon a navigable waterway may form a port authority. Eleven port authorities have been formed along the Missouri and Mississippi Rivers. The department is frequently contacted by interested communities concerning the port authority program.

During 1986, four capital improvement projects were completed in the Kansas City, St. Louis City and the Southeast Missouri Regional Port Authorities. Work continues statewide on 11 port capital improvement projects that were funded during 1985.

In addition to providing technical assistance, funding was also provided to assist port authorities in the administration of their port development programs. During the year, \$327,000 in grants was spent by 10 port authorities and the Bi-

State Development Agency, the coordinating agency for the Port of Metropolitan St. Louis. These funds are used by the recipients for managerial, engineering, legal, research, promotion, planning and other non-construction related expenses.

PORT DEVELOPMENT ADMINISTRATIVE GRANTS

PORT AUTHORITY	AMOUNT
Kansas City	\$ 33,000
Howard/Cooper County Regional	30,000
St. Louis County	25,000
St. Louis City	25,000
Bi-State Development Agency	14,000
Jefferson County	18,000
New Bourbon	4,000
Southeast Missouri Regional	57,500
Mississippi County	26,000
New Madrid County	37,000
Pemiscot County	57,500
TOTAL	\$327,000

Finances



STATEMENT OF RECEIPTS AND DISBURSEMENTS FINANCIAL SUMMARY FOR CALENDAR YEAR 1986

	<u>RECEIPTS</u>	<u>DISBURSEMENTS</u>
HIGHWAY FUNCTION:		
BASIC REVENUE:		
Motor Vehicle License	\$ 162,519,771.22	--
Motor Bus & Truck Fees	3,627,253.68	--
Motor Vehicle Use Tax	29,503,736.26	--
Drivers License Fees	9,977,802.79	--
Motor Vehicle Inspection Fees	2,197,309.00	--
Motor Fuel Tax Receipts	170,315,822.70	--
Vehicle Sales Tax Receipts	55,817,243.21	--
Subtotal	\$433,958,938.86	--
OTHER REVENUE:		
Miscellaneous Escrow Fees	\$ 543,780.96	--
Reciprocity Fund Interest	106,743.75	--
Road Fund Interest	5,189,141.42	--
Other Miscellaneous	9,516,381.05	--
Subtotal	\$ 15,356,047.18	--
FEDERAL REIMBURSEMENT:		
Federal Highway Administration	\$ 326,536,089.55	--
Corps of Engineers	73,536.76	--
Subtotal	\$ 326,609,626.31	--
Construction	--	\$ 471,767,720.97
Maintenance	--	173,170,893.41
Administration	--	47,200,814.42
Refund of Motor & Aviation Fuel Tax	--	7,974,069.63
O.A.S.I.	--	9,536,852.86
<u>TOTAL FOR HIGHWAY FUNCTION</u>	<u>\$ 775,924,612.35</u>	<u>\$ 709,650,351.29</u>

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	<u>RECEIPTS</u>	<u>DISBURSEMENTS</u>
TRANSPORTATION FUNCTION:		
Administration	--	\$ 724,876.00
Transit	--	6,758,107.56
Aviation	--	3,317,283.60
Rail	--	485,939.05
Water	--	332,282.89
General Revenue Fund	\$ 4,417,760.03	--
Federal Funds	5,172,472.08	--
Transportation Trust Fund	563,810.49	--
Aviation Trust Fund	<u>115,591.48</u>	<u>--</u>
<u>TOTAL FOR TRANSPORTATION FUNCTION</u>	<u>\$ 10,269,634.08</u>	<u>\$ 11,618,489.10</u>
MISSISSIPPI RIVER PARKWAY COMMISSION	\$ 10,759.14	\$ 10,759.14
THIRD STATE BUILDING TRUST FUND	967,770.30	967,770.30
THIRD STATE BUILDING FUND	3,179,774.61	3,179,774.61
OTHER STATE DEPTS. (FROM HWY. FUNDS)	<u>--</u>	<u>99,712,593.55</u>
<u>GRAND TOTALS</u>	<u>\$790,352,550.48</u>	<u>\$ 825,139,737.99</u>

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